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NATIONAL DAM SAFETY PROGRAM. NEWTOWN-HOFFMAN WATERSHED PROJECT--ETC(U)
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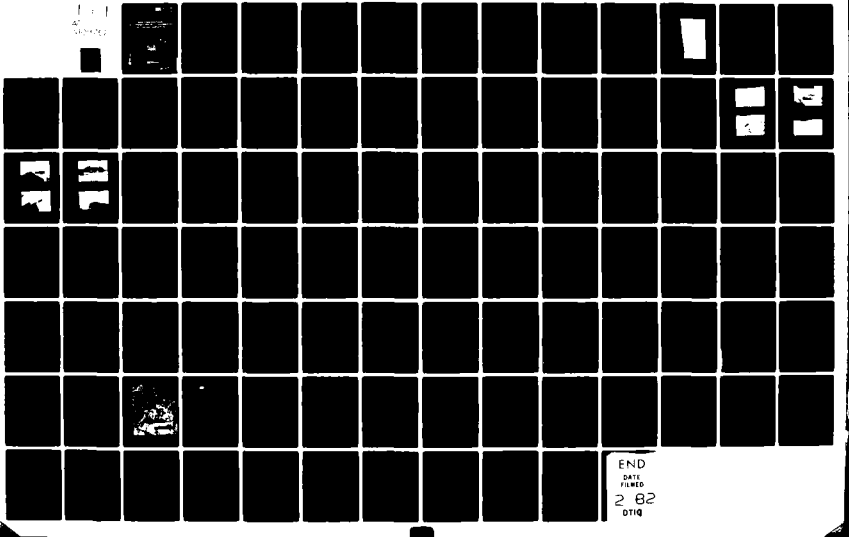

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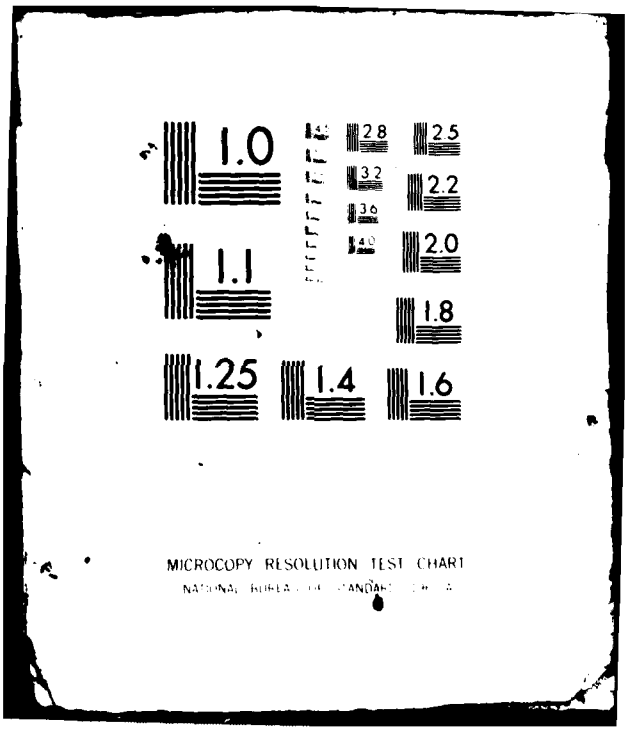
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Newton- Hoffman Watershed Project Dam
Chemong River Basin
Chemung County

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Based on the evaluation of the existing conditions, the condition of the Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 is considered to be good. The examination of documents and visual observations did not reveal conditions which constitute a hazard to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of 100 percent of the Probable Maximum Flood (PMF). Therefore, the spillway capacity is rated as adequate.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 18
N.Y. 700
DEC I.D. NO. 61D-4285
CHEMUNG RIVER BASIN
CHEMUNG COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 N.Y. 700
State Located:	New York
County Located:	Chemung
Stream:	Hoffman Brook (a tributary of Chemung River)
Date of Inspection:	June 24, 1981 and July 15, 1981

ASSESSMENT

Based on the evaluation of the existing conditions, the condition of the Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 is considered to be good. The examination of documents and visual observations did not reveal conditions which constitute a hazard to human life or property.

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of 100 percent of the Probable Maximum Flood (PMF). Therefore, the spillway capacity is rated as adequate.

The following recommendation should be implemented within three months from notification to the owner:

1. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of an emergency.

Assessment - Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18

Lawrence D. Andersen, P.E.
Vice President
D'Appolonia Consulting Engineers, Inc.
Pittsburgh, Pennsylvania

Approved by: _____
Col. W. M. Smith, Jr.
New York District Engineer

Date: 11 Sep 81

NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 18
N.Y. 700
DEC I.D. 61D-4285
JUNE 24, 1981

OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 18
N.Y. 700
DEC I.D. NO. 61D-4285
CHEMUNG RIVER BASIN
CHEMUNG COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

The inspection was to evaluate the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property, and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Dam and Appurtenances

Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 consists of an earth embankment approximately 780 feet long with a maximum height of about 71 feet from the downstream toe. The embankment has a design crest width of 20 feet and an upstream slope of 3 horizontal to 1 vertical, with a 10-foot-wide berm near the normal pool level. The downstream slope is 2.5 horizontal to 1 vertical. The upstream and downstream faces of the dam are covered with grass.

The spillway facilities for the dam consist of two vegetated earth emergency channels, one on each abutment, and a riser-type primary spillway located near the right abutment (looking downstream). The emergency spillways are trapezoidal channels with base widths of 180 feet on the left abutment and 74 feet on the right abutment. The side slopes of the channels are 3 horizontal to 1 vertical for the left abutment spillway and 1 horizontal to 1 vertical for the right abutment spillway. The control sections of the emergency spillways are located in line with the axis of the dam at approximately eight feet below the dam crest level.

The primary spillway structures are comprised of a reinforced concrete intake riser which discharges into a 30-inch-diameter

reinforced concrete pipe, terminating at a reinforced concrete impact basin at the downstream toe. The discharge pipe is equipped with reinforced concrete antiseep collars.

The reservoir drain facilities consist of a 16-inch-diameter cast iron pipe extending from the upstream toe to the primary spillway riser. Flow through the pipe is controlled by a manually operated upstream sluice gate. The gate stem extends along the upstream face of the dam to a hoist, about five feet above the normal pool level, located approximately 25 feet to the left of the primary spillway riser.

b. Location

The dam is located on Hoffman Brook, a tributary of Chemung River, approximately one mile northwest of the city limits of Elmira in Chemung County, New York. Plate 1 illustrates the location of the dam.

c. Size Classification

The dam is classified to be of intermediate size based on its 71-foot height and 750 acre-feet maximum storage capacity.

d. Hazard Classification

The dam is classified to be in the high hazard category. Elmira Reservoir, an earth dam with an approximate height of 34 feet and storage capacity of 420 acre-feet, is located immediately below the dam. Downstream from Elmira Reservoir, Hoffman Brook flows through residential areas of Elmira before joining Chemung River approximately 2.5 miles below the dam.

It is estimated that failure of the dam under maximum pool level would cause loss of more than a few lives and significant property damage in this area.

e. Ownership

The dam is owned and operated by Chemung County, New York. Mr. Stanley Benjamin, County Executive, J. H. Hazlett Building, 205 Lake Street, Elmira, New York 14901, (607) 739-3009.

f. Purpose of Dam

The dam is a floodwater retarding structure.

g. Design and Construction History

The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS) in 1976. Construction of the dam was completed in October 1978.

h. Normal Operating Procedure

The reservoir is normally maintained at the crest level of the primary spillway riser at Elevation 1130.9 (USGS Datum). The emergency spillway crests are at Elevation 1153.5.

1.3 PERTINENT DATA

Elevations referred to in this section and subsequent sections of the report were obtained from design and as-built drawings.

a. Drainage Area (sq. mi.)	3.6
b. Discharge at Dam (cfs)	
Principal spillway at top of dam	160
Auxiliary spillway at top of dam	17970
Reservoir drain at top of dam	40+
Total spillway capacity at top of dam	18130
c. Elevation (USGS Datum) (feet)	
Top of dam	1161.6(1)
Auxiliary spillway crest	1153.5
Principal spillway crest	1130.9
Reservoir drain, invert	1102.5
d. Reservoir (acres)	
Surface area at top of dam	32.0
Surface area at crest of auxiliary spillway	21.0
Surface area at crest of principal spillway	11.0
e. Storage Capacity (acre-feet)	
Top of dam	750
Auxiliary spillway crest	515
Principal spillway crest	137
f. Dam	
Type	Earth embankment
Length	780 feet
Height	71 feet
Top width	20 feet
Side slopes	Downstream: 2.5H:1V
	Upstream: 3H:1V
Zoning	Yes
Impervious core	No
Cutoff	Yes
Grout curtain	No
g. Primary Spillway	
Type	Drop Inlet
Length	15 feet (weir length)
Crest elevation	1130.9

(1) Design crest elevation.

h. Emergency Spillway	
Type	Two trapezoidal earth channels
Length	180 feet (left abutment) 74 feet (right abutment)
Crest elevation	1153.5
i. Regulating Outlet	
Type	16-inch cast iron pipe
Length	72 feet
Access	Accessible through riser
Regulating facilities	Sluice gate

SECTION 2: ENGINEERING DATA

2.1 DATA AVAILABLE

Available information was obtained from New York State Department of Environmental Conservation, Dam Safety Division files, and from the files of the SCS in Syracuse, New York. Available information includes design, as-built drawings, and engineering reports.

2.2 GEOLOGY

The Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 is located in the glaciated Allegheny Plateau section of the Appalachian Plateau Province. This section is characterized as a maturely dissected plateau with the features modified by continental glaciation. The modification consists of rounding off of high areas and deposition of glacial till in the valleys.

The dam site is near the axis of a northeast trending syncline (trending approximately north 70 degrees east). The folding is gentle with the maximum dip of the limbs one to two degrees. The dip of the strata are affected locally by the folding; however, regionally, the rock strata dip south to southwest at approximately 50 to 100 feet per mile. The most prominent fracture orientations in the region have a strike of north 30 degrees west with a vertical dip. A secondary fracture trace strikes north 70 degrees east with a vertical dip, while less prominent fractures strike north-south and north 75 degrees west.

The rock strata in the area consist of unconsolidated Pleistocene glacial till (Wisconsin Drift) underlain by strata of the Lower West Falls Group (Upper Devonian Age). The glacial till consists of a mixture of clay and silt with varying quantities of gravel. The glacial till is relatively thin on hilltops and slopes and up to 40 feet thick in the valleys. The bedrock consists of a thick sequence of interbedded very dark gray to black shale and siltstone which may be up to 2,000 feet thick. The upper portion of the hills west of the dam consists of interbedded very dark gray shales and thin gray siltstone.

The abutment slopes are relatively gentle and not susceptible to landslide slope movement, except near the valley where minor sloughing may occur in the glacial till.

2.3 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted by the SCS in 1971. This program consisted of 19 borings and 63 test pits. Boring and test pit logs are available in SCS files.

The subsurface conditions were described as two to six feet of alluvial gravel over glacial till in the left half of the valley and bedrock near the surface in the right side of the valley. The right abutment rock was classified as shale and siltstone with 0 to 8 feet of silty sand covering the upper slopes. In the left abutment, bedrock was not encountered within the 52-foot investigation depth.

2.4 EMBANKMENT AND APPURTENANT STRUCTURES

Plates 2 and 3 show the plan and the typical cross section of the dam. As shown in Plate 3, the dam consists of a zoned embankment incorporating a centrally located cutoff trench and an internal drainage system consisting of a chimney drain connected to a trench drain beneath the downstream slope. Plate 4 shows the layout and the details of the trench drain.

Most of the embankment is reported to consist of gravelly glacial till. As shown in Plate 3, this material was placed in the cutoff trench and was extended to the crest level through a 20-foot-wide zone at the center line of the embankment. A portion of the upstream slope and the section of the downstream slope consist of rock fill.

Plate 5 shows the plan and the typical cross section of the primary spillway and reservoir drain facilities. Plates 6, 7, and 8 include selected subsurface investigation boring logs.

The spillway facilities were designed based on hydrologic and hydraulic analyses conducted by the SCS. The design calculations are available in SCS files.

2.5 CONSTRUCTION RECORDS

The dam was constructed under the supervision of the SCS. Complete construction records are available in SCS files. No major post-construction changes were instituted.

2.6 OPERATING RECORDS

Because the dam is an ungaged flood-retarding structure, no operating records are maintained for the dam. During severe weather conditions, the dam is monitored by the SCS and Chemung County personnel.

2.7 EVALUATION OF DATA

The information obtained from the state and SCS files is considered to be adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspections of the dam were conducted on June 24 and July 15, 1981. On both dates, the pool level was approximately at the primary spillway crest.

b. Embankment

No signs of distress, seepage, or misalignment were observed. While the crest of the dam is covered with grass, the upstream and downstream faces are covered with crown-vetch. It appears that a portion of the upstream slope in the vicinity of the berm may have settled slightly. The upstream berm, while above water level in the area near the abutments, was submerged at the center of the dam. There are two internal drainage pipes which discharge into the stream from each side of the primary spillway impact basin. The pipe right of the impact basin was found to be discharging approximately 10 to 15 gallons per minute, while the pipe on the left was dry. The top of the dam was surveyed relative to the emergency spillway crest elevation and was found to be in conformance with as-built elevations.

c. Primary Spillway

The primary spillway facilities consist of a concrete drop inlet structure discharging into a 30-inch reinforced concrete pipe terminating at an impact basin at the downstream toe. Components of the primary spillway were in satisfactory condition.

d. Emergency Spillway

The emergency spillways are trapezoidal vegetated earth channels with one located on the left abutment and the other on the right abutment. The channels are in good condition. The grass cover is well established and adequately maintained. The approach and discharge channels were free of brush and trees or debris which could pose a potential for blockage of the spillways.

e. Reservoir Drain

The reservoir drain facilities consist of a 16-inch-diameter cast iron pipe, extending from the upstream toe to the primary spillway riser. Flow through the pipe is controlled by a manually operated sluice gate. The gate was partially opened by county personnel and observed to be functional.

f. Downstream Channel

The downstream channel below the primary spillway concrete impact basin is the natural stream bed. The channel appears to be stable in the near vicinity of the dam.

g. Reservoir

There are no visible signs of instability or sedimentation problems within the reservoir area.

3.2 EVALUATION

The dam was found to be in good condition. At this time, no conditions were observed that would require remedial action.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The reservoir is normally maintained at the crest level of the primary spillway. The dam is a flood-retarding structure and has no formal operating procedure.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by Chemung County Soil and Water Conservation District and the maintenance condition of the dam is considered to be satisfactory.

4.3 WARNING SYSTEM IN EFFECT

No formal warning system exists for the dam.

4.4 EVALUATION

The maintenance condition of the dam is considered to be good. Development of an emergency action plan is considered to be advisable. It is reported by the SCS, Broome County office, that such a plan is currently being prepared.

SECTION 5: HYDRAULIC/HYDROLOGY

5.1 DRAINAGE AREA CHARACTERISTICS

Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 has a drainage area of 3.6 square miles. The watershed is comprised of woodlands and farmlands. Relief ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

As previously stated, the dam is classified as an intermediate dam in the high hazard category. Under the recommended criteria for evaluating emergency spillway discharge capacity, such impoundments are required to pass full PMF.

The PMF inflow hydrograph for the reservoir was determined using the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. The data used for the computer input are presented in Appendix D.

5.3 SPILLWAY CAPACITY

The spillway facilities for the dam consist of a primary and two emergency spillways. The emergency spillways are trapezoidal earth channels with one located on each abutment. The combined base width of the channels is 254 feet. Based on the available head relative to the dam crest, the combined capacity of the primary and emergency spillways is calculated to be 18130 cfs.

5.4 RESERVOIR CAPACITY

The dam impounds a reservoir with a storage capacity of 137 acre-feet at the primary spillway crest level (Elevation 1130.9), 515 acre-feet at the emergency spillway crest level (Elevation 1153.5), and 750 acre-feet at the top of the dam (Elevation 1161.6).

5.5 FLOODS OF RECORD

No data available.

5.6 OVERTOPPING POTENTIAL

The PMF inflow hydrograph was determined according to the recommended criterion and was found to have a peak discharge of 7655 cfs. The hydrograph was routed through the dam using the capacity rating data included in the design files and the dam was found to pass full PMF with the reservoir at Elevation 1158.5, leaving 3.1 feet of freeboard to the design dam crest level.

5.7 EVALUATION

The spillway can pass the recommended spillway design flood of full PMF without overtopping the embankment; therefore, the spillway capacity is classified to be adequate according to the recommended criteria.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

As discussed in Section 3, the field observations did not reveal any signs of distress that would significantly affect the stability of the dam at this time. However, it should be understood that because the dam is a flood control facility and was at normal low pool level at the time of inspection, it was not under maximum loading conditions which would occur only during the passage of major floods.

b. Design and Construction Data

The dam was designed based on geological and geotechnical studies, which included subsurface investigations, laboratory materials testing and engineering analyses. A SCS memorandum, dated March 13, 1972 and included in Appendix G, summarized the findings and results of the design investigation.

The stability analyses were performed using the Swedish Circle Method. The total stress strength parameters used were: internal friction angle, 16 degrees; cohesion, 850 pounds per square foot; saturated and submerged unit weights, 145 and 82.5 pounds per cubic foot, respectively.

Factors of safety were reported to be 1.57 for the 3 horizontal to 1 vertical upstream slope under rapid drawdown conditions, and 1.5 for the 2.5 horizontal to 1 vertical downstream slope under steady state seepage conditions. The available information was reviewed and found to be adequate.

The calculated factors of safety for this dam are in excess of the minimum factors of safety recommended by the Corps of Engineers. The dam is, therefore, considered to have adequate stability.

c. Postconstruction Changes

None reported.

d. Seismic Stability

The dam is located in Seismic Zone 1. Based on the recommended criteria for evaluation of seismic stability of dams, the structure is presumed to present no hazard from earthquakes.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Visual observations indicate that Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18 is in good condition. No conditions were observed that would significantly affect the overall performance of the structure at this time. However, as previously noted, the dam was not inspected under its maximum loading condition which would occur when the reservoir is filled during major storms.

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of full PMF without overflowing the embankment; therefore, the spillway capacity is classified to be adequate.

b. Adequacy of Information

Available information, in conjunction with visual observations, is considered to be sufficient to make a Phase I evaluation.

c. Need for Additional Investigations

No additional investigation is considered to be required at this time.

d. Urgency

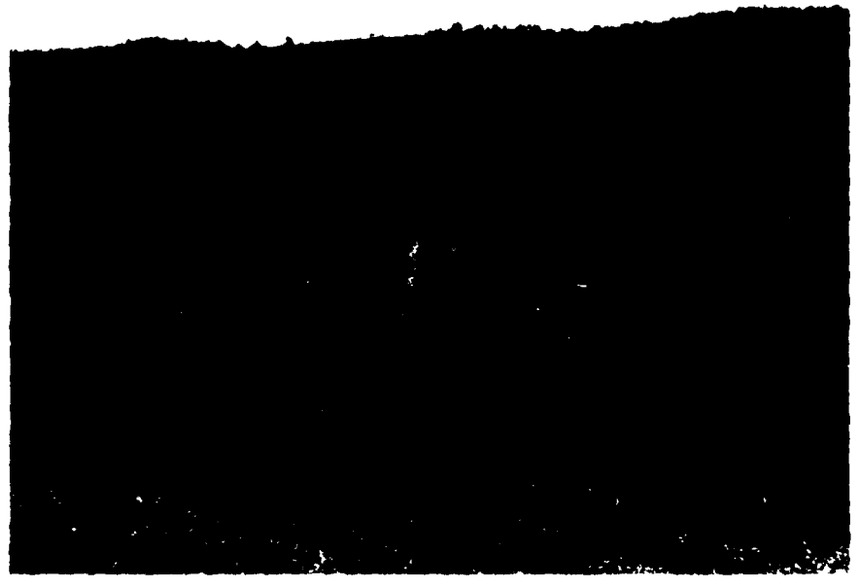
The action recommended below should be implemented within three months from notification to the owner.

7.2 RECOMMENDATION

1. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of an emergency.

APPENDIX A

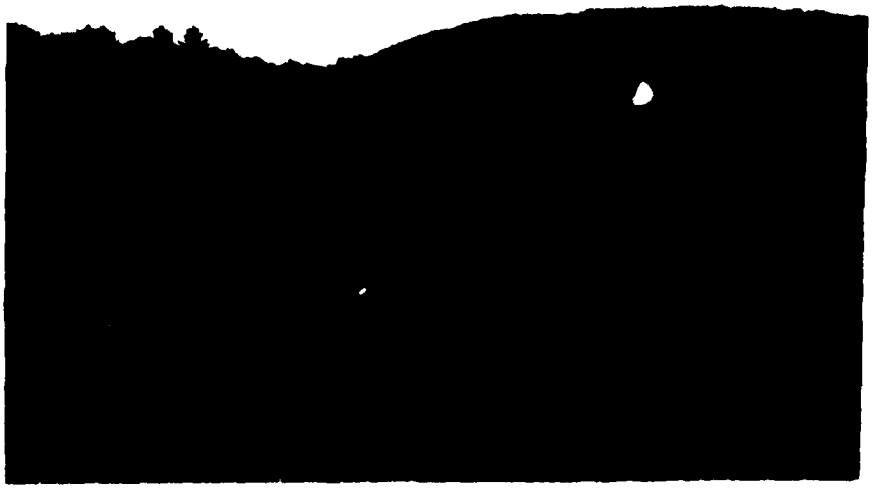
PHOTOGRAPHS



PHOTOGRAPH NO. 1
Dam Crest (looking south)

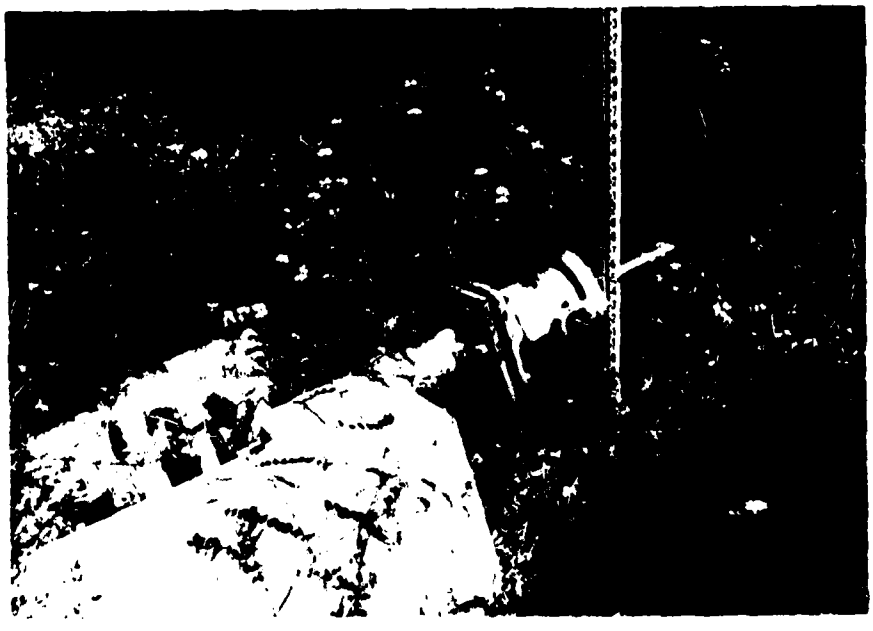
PHOTOGRAPH NO. 2
Downstream Face (looking south)

PHOTOGRAPH NO. 3
Right Abutment Emergency Spillway Channel

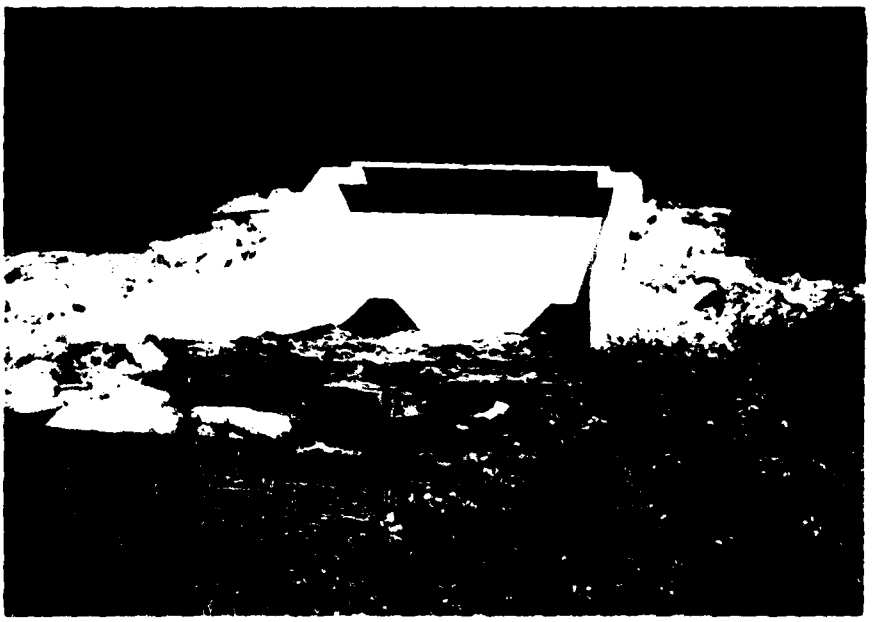


PHOTOGRAPH NO. 4
Left Abutment Emergency Spillway Channel

PHOTOGRAPH NO. 5
Primary Spillway Intake Riser



PHOTOGRAPH NO. 6
Reservoir Drain Sluice Gate Hoist



PHOTOGRAPH NO. 7
Primary Spillway Impact Basin

PHOTOGRAPH NO. 8
Elmira Reservoir Dam
(0.5 mile downstream)

APPENDIX B

VISUAL INSPECTION CHECKLIST

APPENDIX B
VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18

Fed. I.D. # N.Y. 700 DEC Dam No. 61D-4285

River Basin Chemung River Basin

Location: One mile northwest of Elmira, in Chemung County

Stream Name Hoffman Brook

Tributary of Chemung River

Latitude (N) 42° 06.9' Longitude (W) 76° 51.5'

Type of Dam Earth

Hazard Category High

Date(s) of Inspection June 24, 1981 and July 15, 1981

Weather Conditions Sunny, Temp. 80 degrees

Reservoir Level at Time of Inspection El. 1131.1 ±

b. Inspection Personnel Lawrence Andersen, P.E.; James Poellot, P.E.; Bilgin Erel, P.E.; and Michael Bort

c. Persons Contacted (Including Address & Phone No.)

Mr. Stanley Benjamin, Chemung County Executive, J. H. Hazlett Building, 205 Lake Street, Elmira, New York 14901, (607) 739-3009

d. History:

Date Constructed 1978 Date(s) Reconstructed N/A

Designer USDA Soil Conservation Service

Constructed by Bestway Construction, Inc., Endicott, New York

Owner Chemung County, New York

2) Embankment

a. Characteristics

(1) Embankment Material Earth

(2) Cutoff Type Trapezoidal cutoff trench, 20 to 30 feet wide at the base, to varied depths.

(3) Impervious Core None

(4) Internal Drainage System A chimney drain connected to a trench drain equipped with two 8-inch-diameter perforated drainage pipes.

(5) Miscellaneous --

b. Crest

(1) Vertical Alignment Good (0.2 to 0.8 foot above design dam crest elevation)

(2) Horizontal Alignment Good

(3) Surface Cracks None

(4) Miscellaneous --

c. Upstream Slope

(1) Slope (Estimate) 3H:1V (as designed and as measured)

(2) Undesirable Growth or Debris, Animal Burrows None

(3) Sloughing, Subsidence or Depressions None

(4) Slope Protection Vegetated Slope

(5) Surface Cracks or Movement at Toe None

d. Downstream Slope

(1) Slope (Estimate) 2.5H:1V (as designed and as measured)

(2) Undesirable Growth or Debris, Animal Burrows None

(3) Sloughing, Subsidence or Depressions None

(4) Surface Cracks or Movement at Toe None

(5) Seepage None

(6) External Drainage System (Ditches, Trenches, Blanket)

None

(7) Condition Around Outlet Structure Good

(8) Seepage Beyond Toe None

e. Abutments - Embankment Contact

No problems observed.

(1) Erosion at Contact None

(2) Seepage Along Contact None

3) Drainage System

a. Description of System A chimney drain connected to a trench drain located under the downstream toe of the dam. The trench drain is equipped with two 8-inch-diameter perforated pipes, one for each side of the dam.

b. Condition of System Only the downstream end of the pipes were visible.

c. Discharge from Drainage System Left pipe dry, right pipe discharging approximately 10 to 15 gpm (estimated).

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, etc.)

None

5) Reservoir

a. Slopes Moderate slopes, no problems observed.

b. Sedimentation No problems observed.

c. Unusual Conditions Which Affect Dam None observed.

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Elmira Reservoir, an earth dam approximately 34 feet high with a storage capacity of 420 acre-feet, is immediately downstream of the dam. Downstream of Elmira Reservoir, Hoffman Brook flows through residential areas of Elmira to the confluence with Chemung River, 2.5 miles downstream from the dam.

b. Seepage, Unusual Growth None

c. Evidence of Movement Beyond Toe of Dam None

d. Condition of Downstream Channel Good

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General Service Spillway: Concrete riser discharging into a 30-inch-diameter reinforced concrete pipe. Auxiliary Spillways: Two trapezoidal vegetated earth channels located at each abutment. The base width of the left spillway is 180 feet and the base width of the right spillway is 74 feet.

b. Condition of Service Spillway Good

c. Condition of Auxiliary Spillway Good

d. Condition of Discharge Conveyance Channel Good

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other Cast iron pipe, Class 25

Size: 16-inch-diameter Length 72 feet

Invert Elevations: Entrance 1102.5 Exit 1102.15 (as built)

Physical Condition (Describe): Not observable.

Material: --

Joints: -- Alignment --

Structural Integrity: --

Hydraulic Capability: --

Means of Control: Gate X Valve _____ Uncontrolled _____

Operation: Operable X Inoperable _____ Other _____

Present Condition (Describe): The reservoir drain was observed operating.

9) Structural

a. Concrete Surfaces The concrete riser and outlet structure appear to be in good condition.

b. Structural Cracking The outlet structure had some cracking on the baffle slab.

c. Movement - Horizontal & Vertical Alignment (Settlement)

None observed.

d. Junctions with Abutments or Embankments

No problems observed.

e. Drains - Foundation, Joint, Face

No problems observed.

f. Water Passages, Conduits, Sluices

N/A

g. Seepage or Leakage None observed.

h. Joints - Construction, etc. No problems observed.

i. Foundation Not visible.

j. Abutments N/A

k. Control Gates Operable

l. Approach & Outlet Channels Good

m. Energy Dissipators (Plunge Pool, etc.) Good condition.

n. Intake Structures Good

o. Stability N/A

p. Miscellaneous ---

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition None

APPENDIX C

ENGINEERING DATA CHECKLIST

APPENDIX C
ENGINEERING DATA CHECKLIST
NAME OF DAM: NEWTOWN-HOFFMAN CREEKS WATERSHED
PROJECT - FLOODWATER RETARDING DAM SITE 18

AREA-CAPACITY DATA:

		Elevation (feet)	Surface Area (acres)	Storage Capacity (acre-feet)
1)	Top of Dam	1161.6	32.0	750.0
2)	Design High Water (Max. Design Pool)	1158.5	27.1	652.0
3)	Auxiliary Spillway Crest	1153.5	21.0	515.0
4)	Service Spillway Crest	1130.9	11.0	137.0

DISCHARGES

		Discharge (cfs)
1)	Average Daily	6 ±
2)	Auxiliary Spillway at Maximum High Water (Top of Dam)	17970
3)	Auxiliary Spillway at Design High Water (El. 1158.5)	7637
4)	Principal Spillway at Auxiliary Spillway Crest Elevation 1153.5	160
5)	Low Level Outlet	40 ±
6)	Total of All Facilities at Maximum High Water	18170
7)	Maximum Known Flood	Unknown
8)	At Time of Inspection	10 ±

DAM: Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 18

CREST ELEVATION: 1161.6

Type: Earth embankment.

Width: 20 feet Length: 780 feet

Spillover: Concrete riser and vegetated earth channels.

Location: Concrete riser near the right abutment, earth channels at both abutments.

SPILLWAY:

SERVICE		AUXILIARY
1130.9	Elevation	1153.5
Concrete drop inlet	Type	Two trapezoidal vegetated earth channels; left side 3H:1V, right side 1H:1V
15-foot weir	Width	Left side 180 feet, Right side 74 feet
	Type of Control	
Uncontrolled	Uncontrolled	Uncontrolled
	Controlled	
N/A	Type (Flashboards; Gate)	N/A
N/A	Number	N/A
N/A	Size/Length	300± feet
	Invert Material	Vegetated Earth
	Anticipated Length of Operating Service	Unknown
280± feet	Chute Length	N/A
30± feet	Height Between Spillway Crest and Approach Channel Invert (Weir Flow)	7± feet

Hydrometerological Gages:

Type: None

Location: N/A

Records:

Date - N/A

Max. Reading - N/A

FLOODWATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (Mechanisms):

None

DRAINAGE AREA: 3.6 square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Forest and farmlands

Terrain - Relief: Moderate to steep slope

Surface - Soil: Low permeability

Runoff Potential (existing or planned extensive alterations to existing surface or subsurface conditions)

Moderate to high runoff potential (SCS Hydrological Curve Number (CN) 75 was used in the original design calculations).

Potential Sedimentation Problem Areas (natural or man-made; present or future)

None observed.

Potential Backwater Problem Areas for Levels at Maximum Storage Capacity Including Surcharge Storage:

None observed.

Dikes - Floodwalls (overflow and nonoverflow) - Low Reaches Along the Reservoir Perimeter:

Location: None

Elevation:

Reservoir:

Length at Maximum Pool: 2,500± feet; at normal pool, 700± feet

Length of Shoreline at Normal Pool: 1,800± feet

APPENDIX D

HYDROLOGY AND HYDRAULIC ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Newtown-Hoffman Creeks Watershed Project-
Floodwater Retarding Dam Site 18 (NY DEC 61D-4285)

PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.8 INCHES/24 HOURS(1)

STATION	1	2	3	4	5
Station Description	Site 18 Drainage Area	Site 18 Dam			
Drainage Area (square miles)	3.6	—			
Cumulative Drainage Area (square miles)	3.6	3.6			
Adjustment of PMF for Drainage Area (%)					
6 Hours	111	—			
12 Hours	123	—			
24 Hours	132	—			
48 Hours	142	—			
72 Hours	—	—			
Snyder Hydrograph Parameters					
C_p/C_t(2)	0.70/2.1	—			
L (miles)(3)	3.03	—			
L_{ca} (miles)(3)	1.23	—			
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	3.1	—			
Spillway Data					
Crest Length (ft)	—	See spillway capacity rating calculations			
Freeboard (ft)	—				
Discharge Coefficient	—				
Exponent	—				

(1) Hydrometeorological Report 33 (Figure 1), U.S. Army, Corps of Engineers, 1956.
(2) Snyder's Coefficients (see attached calculations).
(3) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  31 APR 80
**********
    1                A1       SNYDER UNIT HYDROGRAPH, SPILLWAY AND DAM OVERTOPPING ANALYSES
    2                A2       NEWTOWN-HOFFMAN SITE-18 DAM,(NY 610-4285)CHEMUNG CO,NY,PROJ NO 80-778-11
    3                A3       FOR 20%,30%,40%,50%,60%,70%,80%,90%,AND 100% PROBABLE MAXIMUM FLOOD(PMF)
    4                B     300        0       15        0        0        0        0        0       -4        0
    5                B1      5
    6                J       1        9        1
    7                J1   0.20     0.30     0.40     0.50     0.60     0.70     0.80     0.90     1.00
    8                K       0        1                                                    1
    9                K1       CALC OF SNYDER INFLOW HYDROGRAPH TO NEWTOWN-HOFF. S-18 DAM,(NY 610-4285)
   10                M       1        1     3.60                3.60                                 1
   11                P                21.8      111      123      132      142
   12                T                                                           1.0     0.05             0.0048
   13                W     3.07     0.70
   14                X     -1.5    -0.05      2.0
   15                K       1        2                                                    1
   16                K1       ROUTING FLOW THROUGH NEWTOWN-HOFFMAN SITE-18 DAM, (N.Y. 610-4285)
   17                Y                                  1        1
   18                Y1      1                                                 -1130.9       -1
   19                Y41130.9  1131.5   1132.5   1136.0   1140.0   1148.0   1152.0   1153.5   1154.0   1154.5
   20                Y41155.0  1155.5   1156.0   1156.5   1157.0   1157.5   1158.5   1160.0   1160.5   1164.0
   21                Y5    0.0    21.0     94.0    124.0    130.0    142.0    147.0    149.0    284.0    605.0
   22                Y51058.0  1638.0   2365.0   3232.0   4167.0   5234.0   7674.0  12153.0  13646.0  27417.0
   23                $A   11.0    21.0     25.0     32.0
   24                $E1130.9  1153.5   1157.0   1161.6
   25                $$1130.9
   26                $01161.6     2.65      1.5    820.0
   27                K      99
```

NOTE: Emergency spillway rating curve per design calculations.

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .20	RATIO 2 .30	RATIO 3 .40	RATIO 4 .50	RATIO 5 .60	RATIO 6 .70	RATIO 7 .80	RATIO 8 .90	RATIO 9 1.00
HYDROGRAPH AT	1	3.60	1	1531.	2297.	3062.	3828.	4593.	5359.	6124.	6890.	7655.
	(	9.32)	(	43.36)(	65.03)(	86.71)(	108.39)(	130.07)(	151.75)(	173.42)(	195.10)(	216.78)
ROUTED TO	2	3.60	1	1284.	2275.	3052.	3816.	4582.	5347.	6110.	6874.	7637.
	(	9.32)	(	36.36)(	64.42)(	86.43)(	108.07)(	129.74)(	151.40)(	173.02)(	194.65)(	216.26)

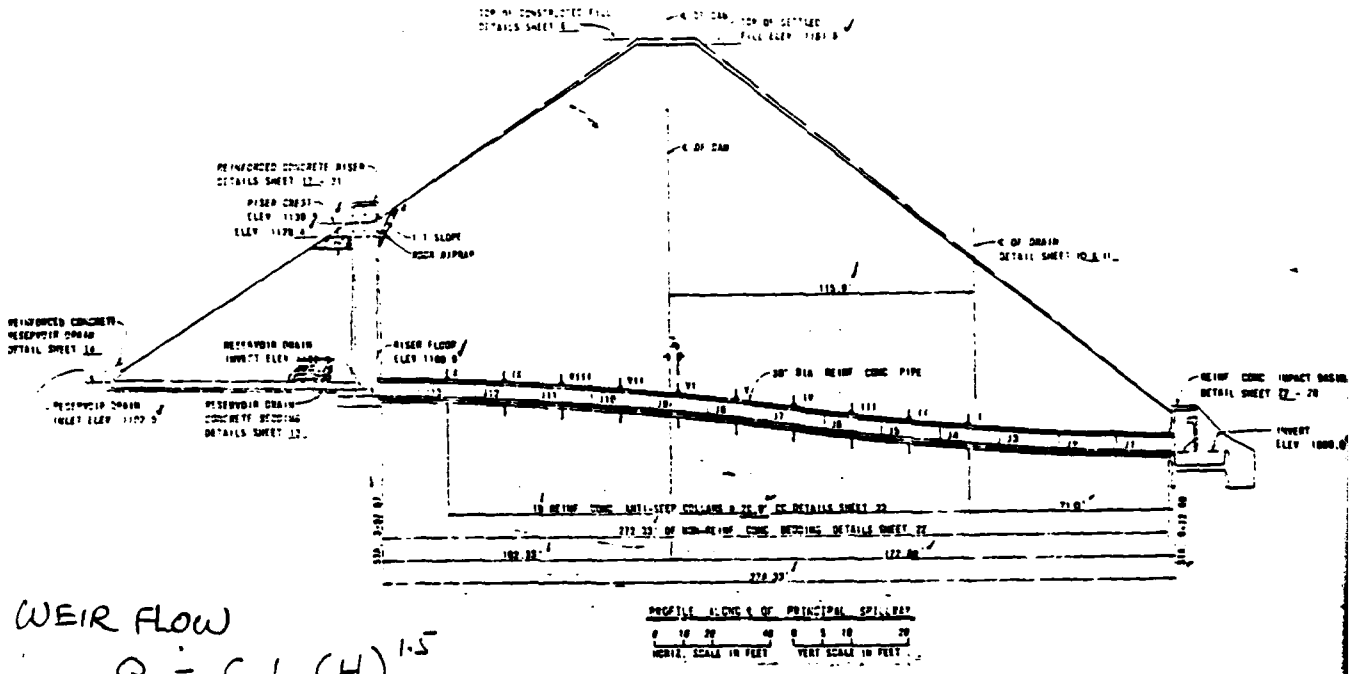
SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1130.90	1130.90	1161.60
STORAGE	0.	0.	567.
OUTFLOW	0.	0.	17974.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1155.19	0.00	393.	1284.	0.00	43.75	0.00
.30	1155.94	0.00	410.	2275.	0.00	42.75	0.00
.40	1156.40	0.00	421.	3052.	0.00	42.75	0.00
.50	1156.81	0.00	431.	3816.	0.00	42.75	0.00
.60	1157.19	0.00	441.	4582.	0.00	42.75	0.00
.70	1157.55	0.00	450.	5347.	0.00	42.75	0.00
.80	1157.86	0.00	458.	6110.	0.00	42.75	0.00
.90	1158.17	0.00	466.	6874.	0.00	42.75	0.00
1.00	1158.48	0.00	475.	7637.	0.00	42.75	0.00

PRIMARY SPILLWAY DISCHARGE RATING



WEIR FLOW

$$Q_1 = C\,L\,(H)^{1.5}$$
$$= (3.22)(15)(W.L\ EL. - 1130.9)^{1.5}$$
$$= 48.3\,(W.L\ EL - 1130.9)^{1.5} \quad \text{—— EQ-5}$$

PIPE FLOW (FROM P.567 DESIGN OF SMALL DAM, 2ND EDITION)

$$H_T = \left[\frac{(2.5204)(1+K_e)}{D^4} + \frac{4\,(0.019)^2 L}{D^{4/3}}\right]\left(\frac{Q_2}{1.5}\right)^2$$

$$[W.L\ EL - 1090] = \left[\frac{(2.5204)(1.9)}{(2.5)^4} + \frac{4\,(0.019)^2 (200)}{(2.5)^{4/3}}\right]\left(\frac{Q_2}{1.5}\right)^2$$

$$Q_2 = (19.5539)\sqrt{W.L\ EL - 1090} \quad \text{—— EQ-6}$$

LAKE ELEV	Q_1 cfs EQ-5	Q_2 cfs EQ-6	PRIMARY SPILLWAY Q_{ps} cfs	LAKE ELEV	$Q_2 = Q_{ps}$ cfs EQ-6	LAKE ELEV	$Q_2 = Q_{ps}$ cfs EQ-6	LAKE ELEV	$Q_2 = Q_{ps}$ cfs EQ-6	LAKE ELEV	$Q_2 = Q_{ps}$ cfs EQ-
1130.9	0	0	0	1134	129.7	1142	141.0	1154.5	157.0	1158	161.
1131	1.5	~~125~~	1.5	1135	131.2	1144	143.7	1155.0	157.6	1158.5	161.
1131.5	22.4	~~1260~~	22.4	1136	132.6	1146	146.3	1155.5	152 3	1159	162
1132.0	55.7	~~126~~7	55.7	1137	134.1	1148	148.9	1156	158 9	1159.5	163
1132.5	97.8	~~127~~5	97 8	1138	135.5	1150	151.5	1156.5	159.5	1160	163
1133.0	~~147~~0	128.2	128.2	1139	136.9	1153.5	155.8	1157	160.1	1161	164
1133.5	~~202~~.5	129.0	129.0	1140	138.3	1154.0	156.4	1157.5	160.7	1162	165

EMERGENCY SPILLWAYS

SPILLWAY CAPACITY RATING

REFERENCE : DESIGN OF SMALL DAM, 2nd EDITION. P 553

A) LEFT SPILLWAY

ASSUMPTION (1) SPECIFIC ENERGY $H_E = d + \frac{V^2}{2g}$

(2) CRITICAL FLOW AT CONTROL SECTION.

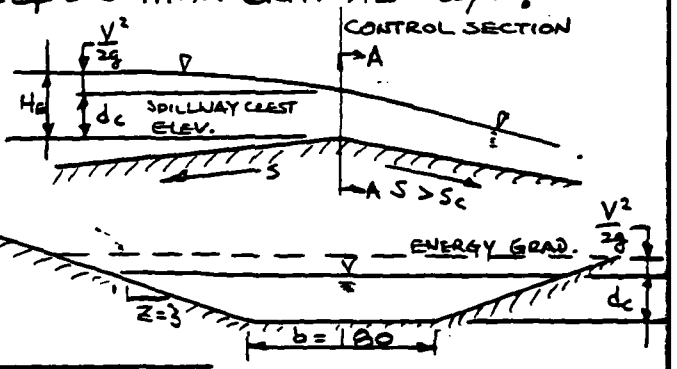
$d = d_c$; $V = V_c$ and H_E = LAKE LEVEL

NO OTHER MINOR LOSSES ARE CONSIDERED

(3) D/S SLOPE IS STEEPER THAN CRITICAL SLOPE.

FROM P 553 of REF:

$$V_c = \sqrt{\frac{b + z d_c}{b + 2z d_c} d_c g} \quad \text{— EQ-1}$$



$$H_E = d_c + \frac{V_c^2}{2g} = d_c + \left(\frac{b + z d_c}{b + 2z d_c} d_c g\right)\left(\frac{1}{2g}\right)$$

$$= \frac{(3b + 5z d_c) d_c}{2b + 4z d_c}$$

$$d_c = \frac{-(3b - 4H_E z) + \sqrt{(3b - 4H_E z)^2 + (4H_E z)(10b)}}{10z} \quad \text{— EQ-2}$$

$A_c = (z d_c + b) d_c$ — EQ-3

$Q_c = A_c V_c$ — EQ 4

LAKE ELEVATION	H_E	d_c EQ-2	A_c EQ 3	V_c EQ-1	Q_c EQ-4	LEFT EMERGENCY
FEET	FT	FT	FT^2	FPS	CFS	SPILLWAY
1153.5	0	0	0	0	0	CREST EL 1153.5
1154.0	0.5	0.3	60.4	3.3	198	b = 180 FT
1154.5	1.0	0.7	121.8	4.6	562	Z = 3
1155.0	1.5	1.0	184.0	5.6	1033	
1155.5	2.0	1.3	247.1	6.5	1609	
1156.0	2.5	1.7	311.2	7.3	2259	
1156.5	3.0	2.0	376.1	7.9	2986	
1157.0	3.5	2.4	441.9	8.6	3783	
1157.5	4.0	2.7	508.6	9.1	4647	
1158.0	4.5	3.0	576.3	9.7	5575	
1158.5	5.0	3.4	644.8	10.2	6564	
1159.0	5.5	3.7	714.3	10.7	7614	
1159.5	6.0	4.1	784.6	11.1	8722	

D'APPOLONIA
CONSULTING ENGINEERS, INC

By WTC Date 8/14/81 Subject NEWTOWN-HOFFMAN CREEK SITE 18 Sheet No. 3 of 4
Chkd. By SKF Date 26AUG81 SPILLWAY RATING Proj. No. 80-773

B) RIGHT EMERGENCY SPILLWAY CAPACITY RATING

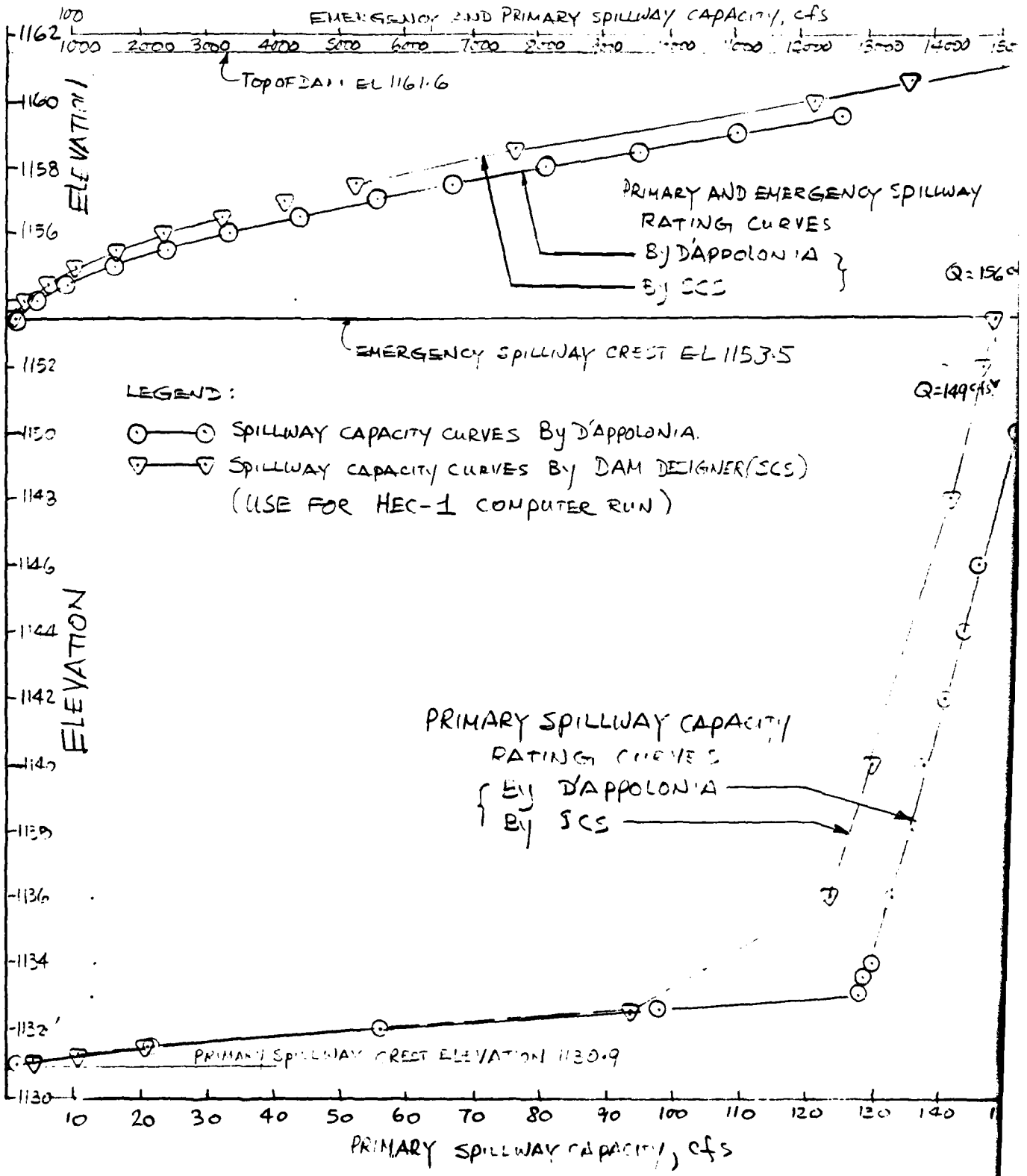
LAKE ELEVATION	HE	dc	Ac	Vc	Q	RIGHT EMERGENCY SPILLWAY
		EQ 2	EQ 3	EQ 1	EQ 1	
FT	FT	FT	FT²	FPS	CFS	
1153.5	0	0	0	0	0	CREST EL 1153.5
1154.0	0.5	0.3	25.0	3.3	82	b = 74 FT
1154.5	1.0	0.7	50.5	4.6	233	C = 3.0 (AVG)
1155.0	1.5	1.0	76.7	5.6	431	
1155.5	2.0	1.3	103.4	6.5	670	
1156.0	2.5	1.7	130.8	7.2	944	
1156.0	3.0	2.0	158.8	7.9	1252	
1157.0	3.5	2.4	187.3	8.5	1592	
1157.5	4.0	2.7	216.5	9.1	1962	
1158.0	4.5	3.1	246.3	9.6	2361	
1158.5	5.0	3.4	276.7	10.1	2739	
1159.0	5.5	3.8	307.7	10.5	3245	
1159.5	6.0	4.1	339.3	11.0	3729	

COMBINED PRIMARY AND TWO EMERGENCY SPILLWAY CAPACITY

LAKE ELEVATION	PRIMARY SPILLWAY Qps, cfs	EMERGENCY SPILLWAY Qe, cfs		COMBINED SPILLWAY cfs	LAKE ELEVATION	PRIMARY SPILLWAY Qps cfs	EMERGENCY SPILLWAY Qe, cfs		COMBINED SPILLWAY cfs
		LEFT	RIGHT				LEFT	RIGHT	
1130.9	0			0	1153.5	155.8	0	0	156
1131	1.5			2	1154.0	156.4	198	82	436
1131.5	22.4			22	1154.5	157.0	562	233	952
1132.0	55.7			56	1155.0	157.6	1038	431	1627
1132.5	97.2			98	1155.5	158.3	1608	670	2436
1133.0	128.2			128	1156.0	158.9	2259	944	3362
1133.5	129.0			129	1156.5	159.5	2936	1252	4398
1134.0	129.7			130	1157.0	160.1	3733	1592	5535
1135	132.6			133	1157.5	160.7	4647	1962	6770
1138	135.5			136	1158.0	161.2	5575	2361	8097
1140	138.3			138	1158.5	161.8	6561	2789	9515
1142	141.0			141	1159.0	162.4	7614	3245	11021
1144	143.7			144	1159.5	163.0	8722	3729	12613
1146	146.3			146					
1150	151.5			152					

D'APPOLONIA
CONSULTING ENGINEERS, INC.

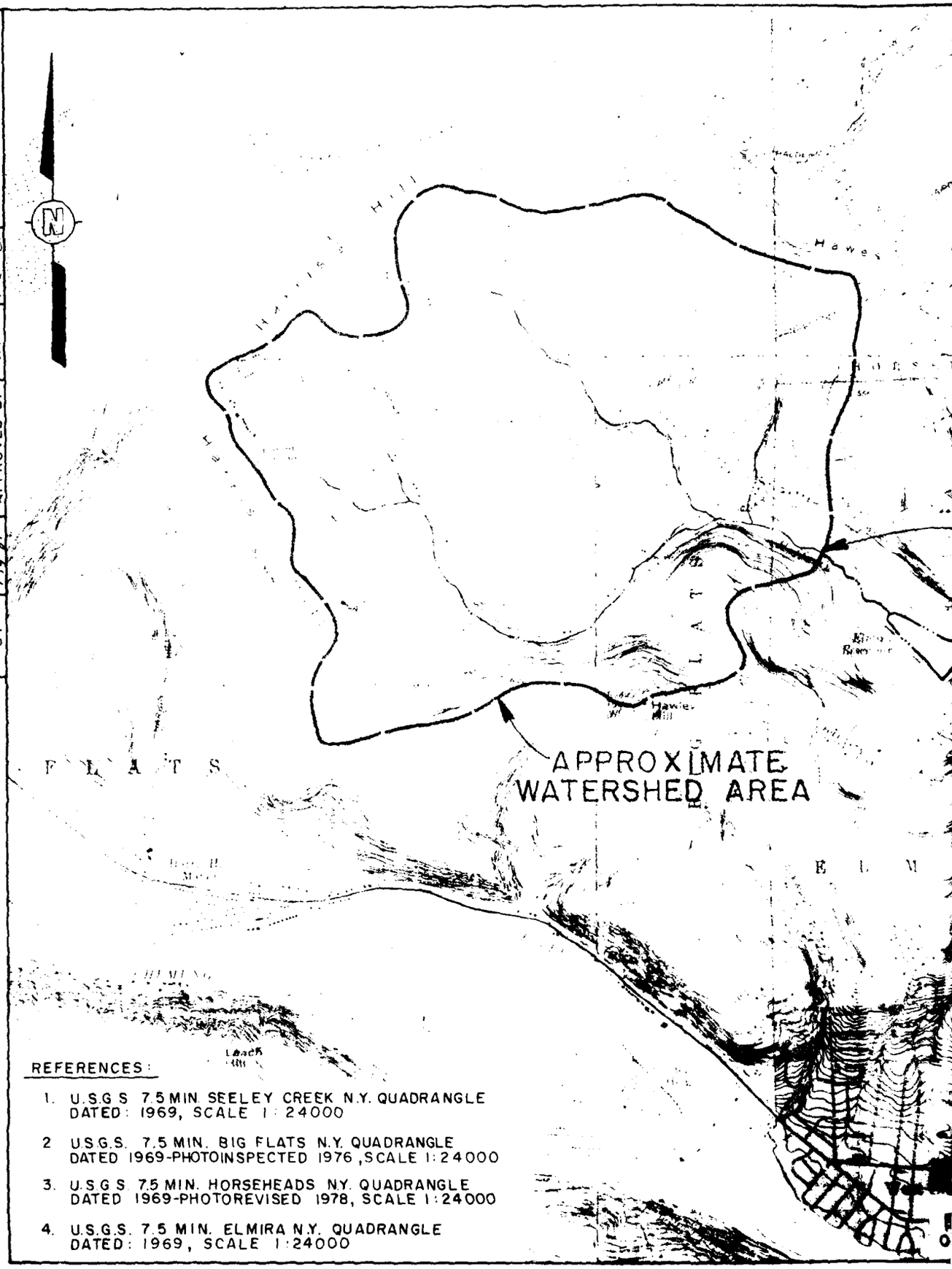
By WTC Date 8/1/82 Subject NEWTOWN-HOFFMAN CREEK SITE 18 Sheet No. 4 of 4
Chkd. By SRP Date 26AUG82 SPILLWAY RATING Proj. No. 80-778



APPENDIX E

PLATES

DRAWN BY	CHECKED BY	DRAWING NUMBER
ABC 7-24-87	APPROVED BY	80-778-B44



REFERENCES:

1. U.S.G.S 7.5 MIN. SEELEY CREEK N.Y. QUADRANGLE DATED: 1969, SCALE 1:24000
2. U.S.G.S. 7.5 MIN. BIG FLATS N.Y. QUADRANGLE DATED 1969-PHOTOINSPECTED 1976, SCALE 1:24000
3. U.S.G.S 7.5 MIN. HORSEHEADS N.Y. QUADRANGLE DATED 1969-PHOTOREVISED 1978, SCALE 1:24000
4. U.S.G.S. 7.5 MIN. ELMIRA N.Y. QUADRANGLE DATED: 1969, SCALE 1:24000

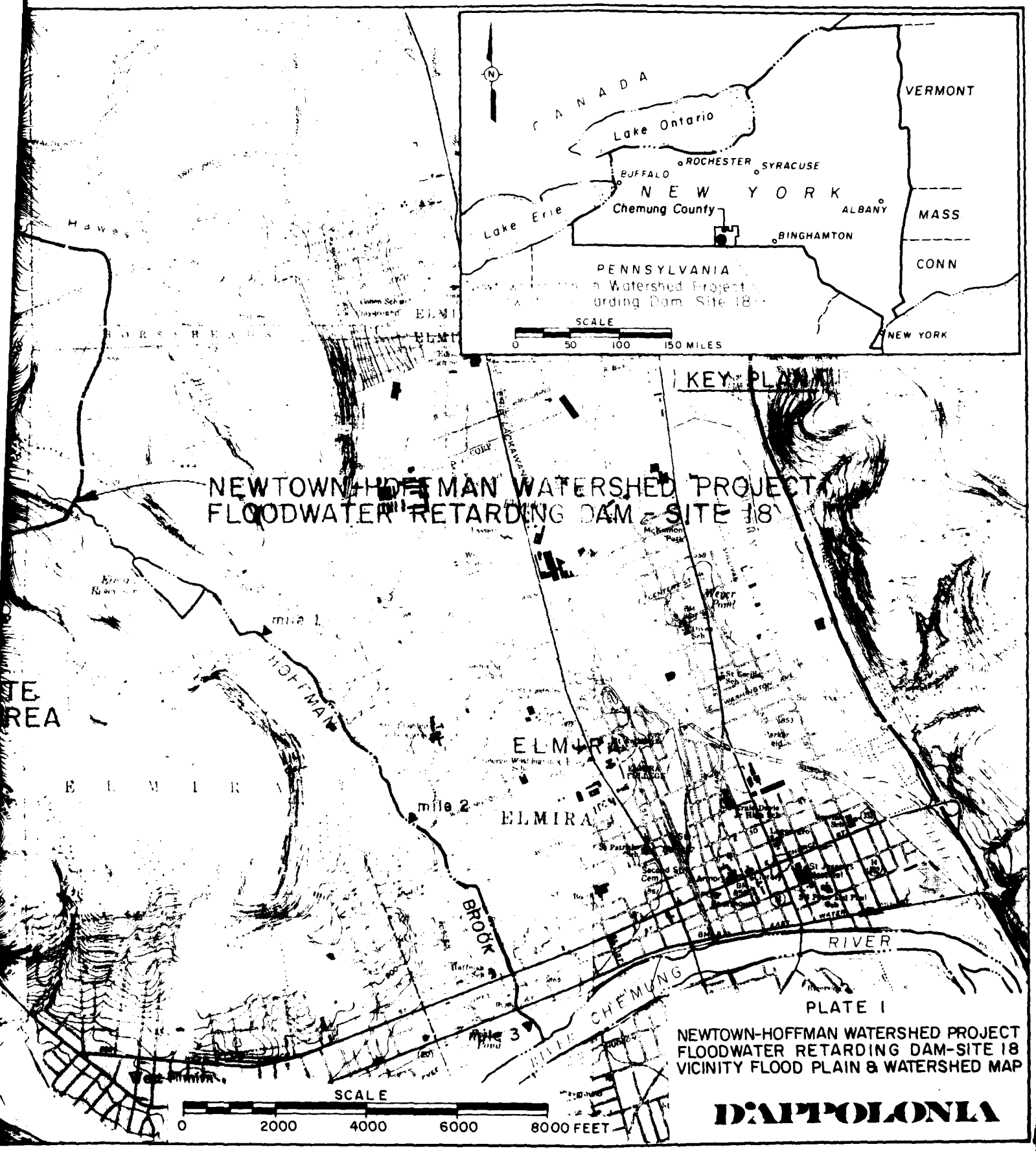
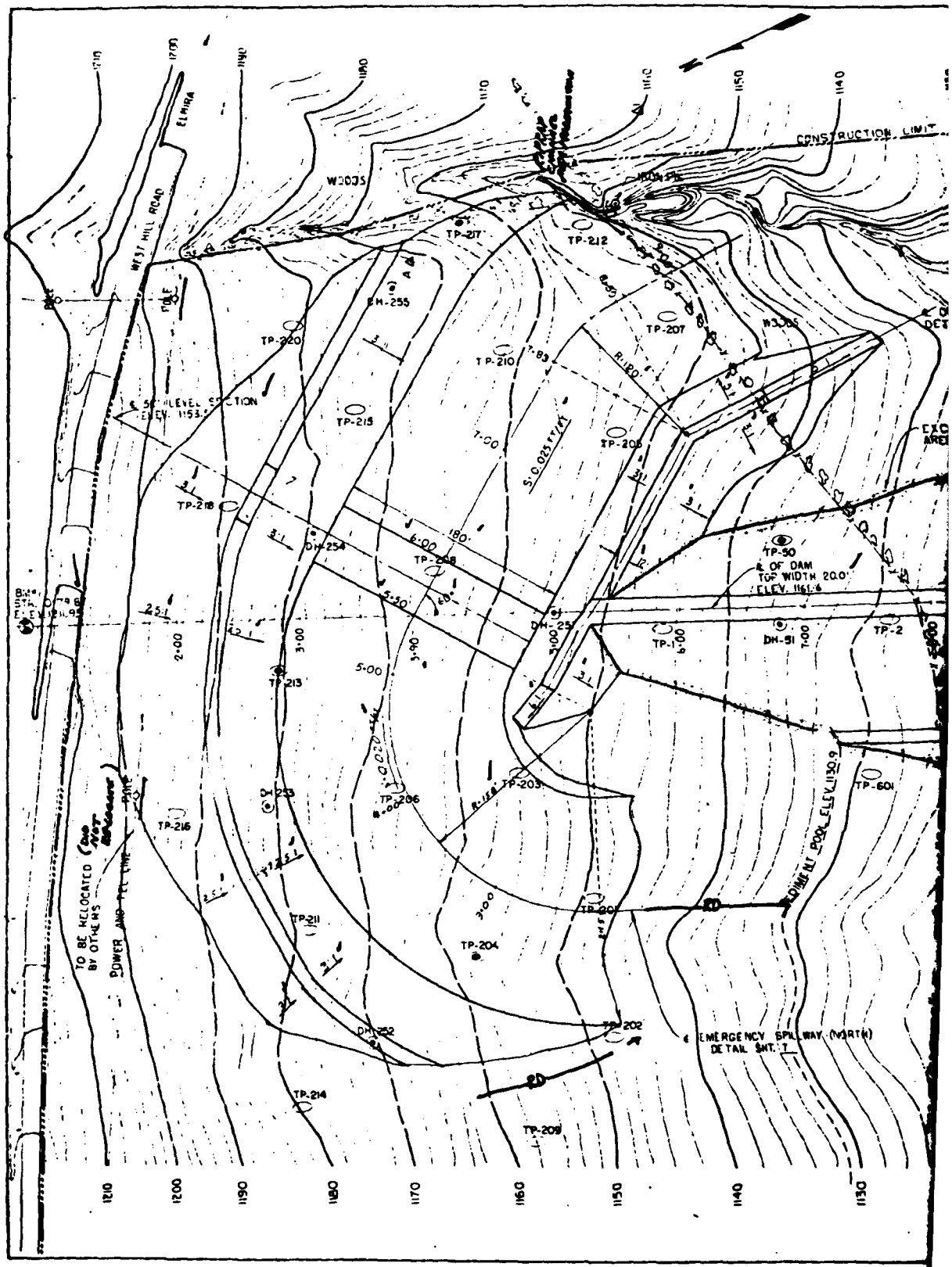


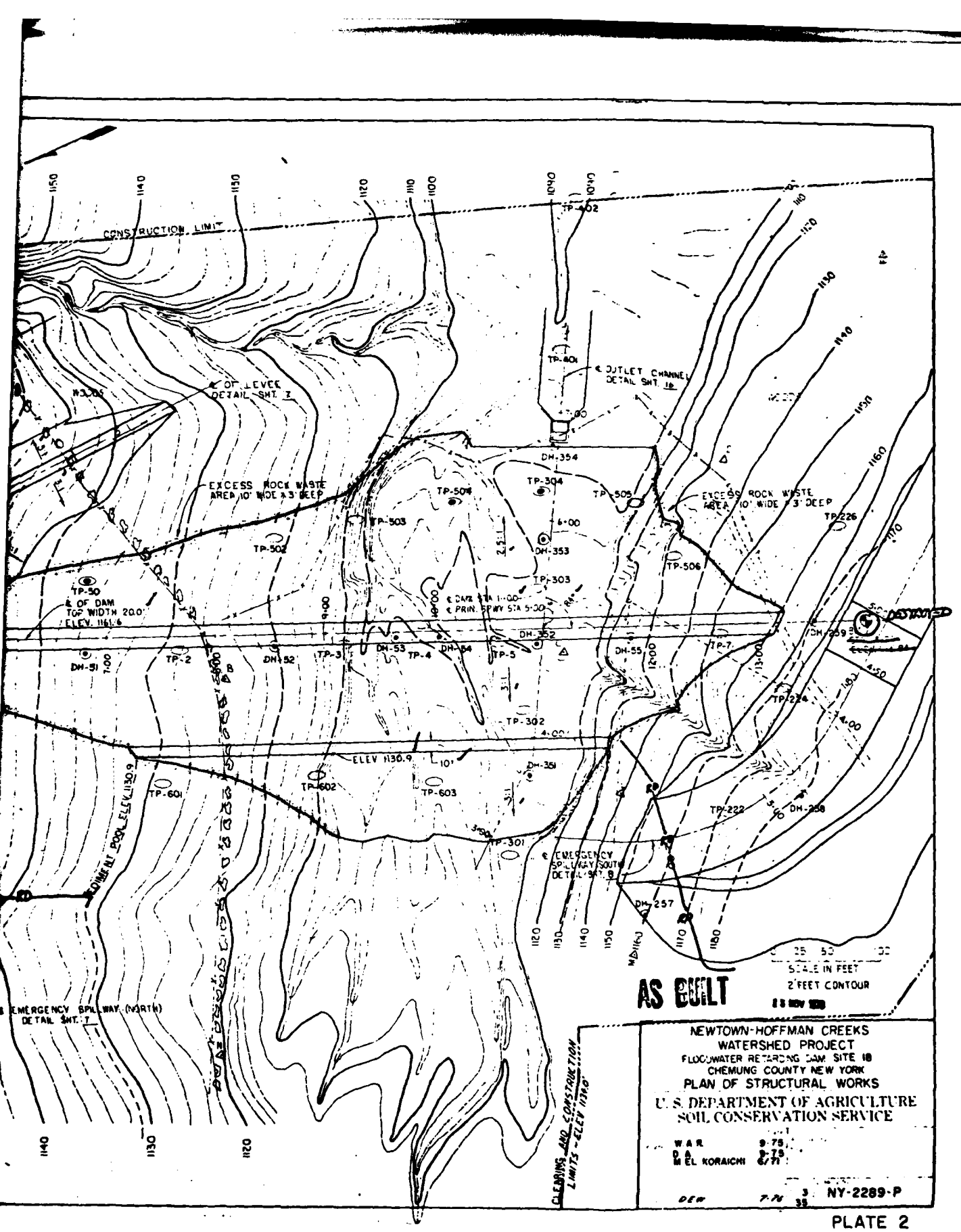
PLATE I

NEWTOWN-HOFFMAN WATERSHED PROJECT
FLOODWATER RETARDING DAM-SITE 18
VICINITY FLOOD PLAIN & WATERSHED MAP

DAPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	RE	7/29/81	DRAWING NUMBER 80-778-B45
	5-28-81	APPROVED BY	JMD	7-29-81	





NEWTOWN-HOFFMAN CREEKS
WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 18
CHEMUNG COUNTY NEW YORK
PLAN OF STRUCTURAL WORKS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

W A R	9-75
D A	9-75
M E L KORAICHI	6/71

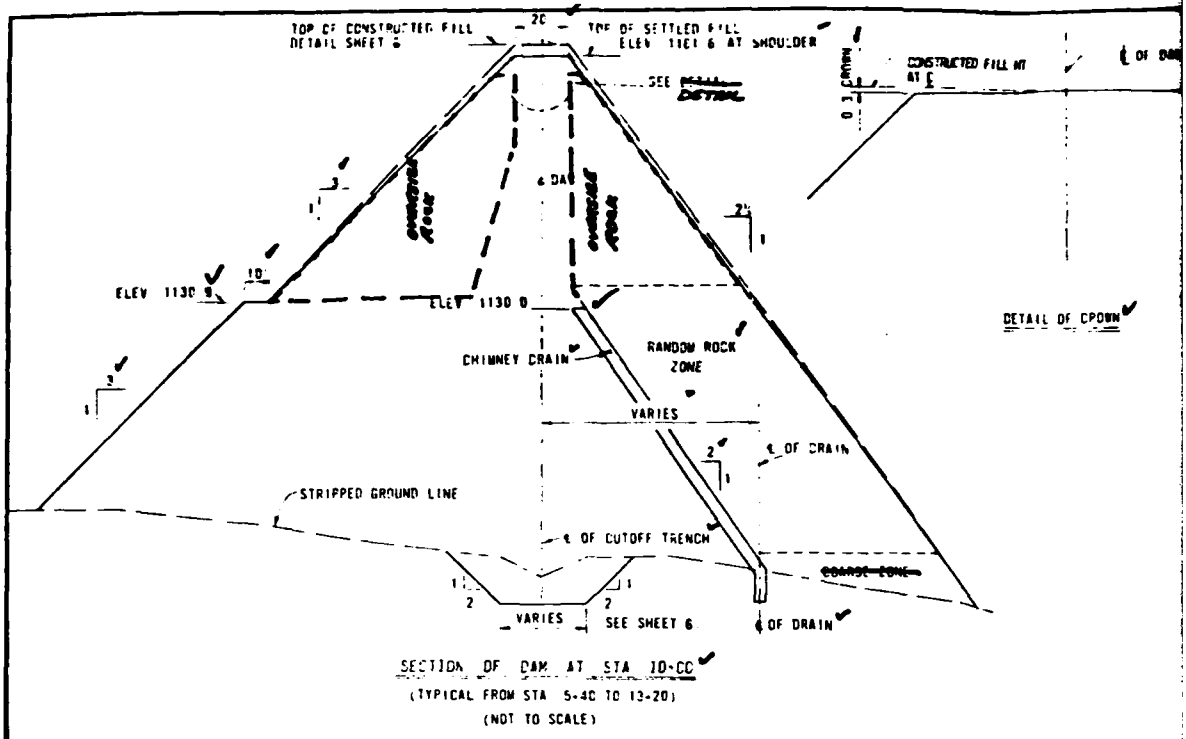
DEN T.N. 3 NY-2289-P

PLATE 2

2

D'APPOLONIA

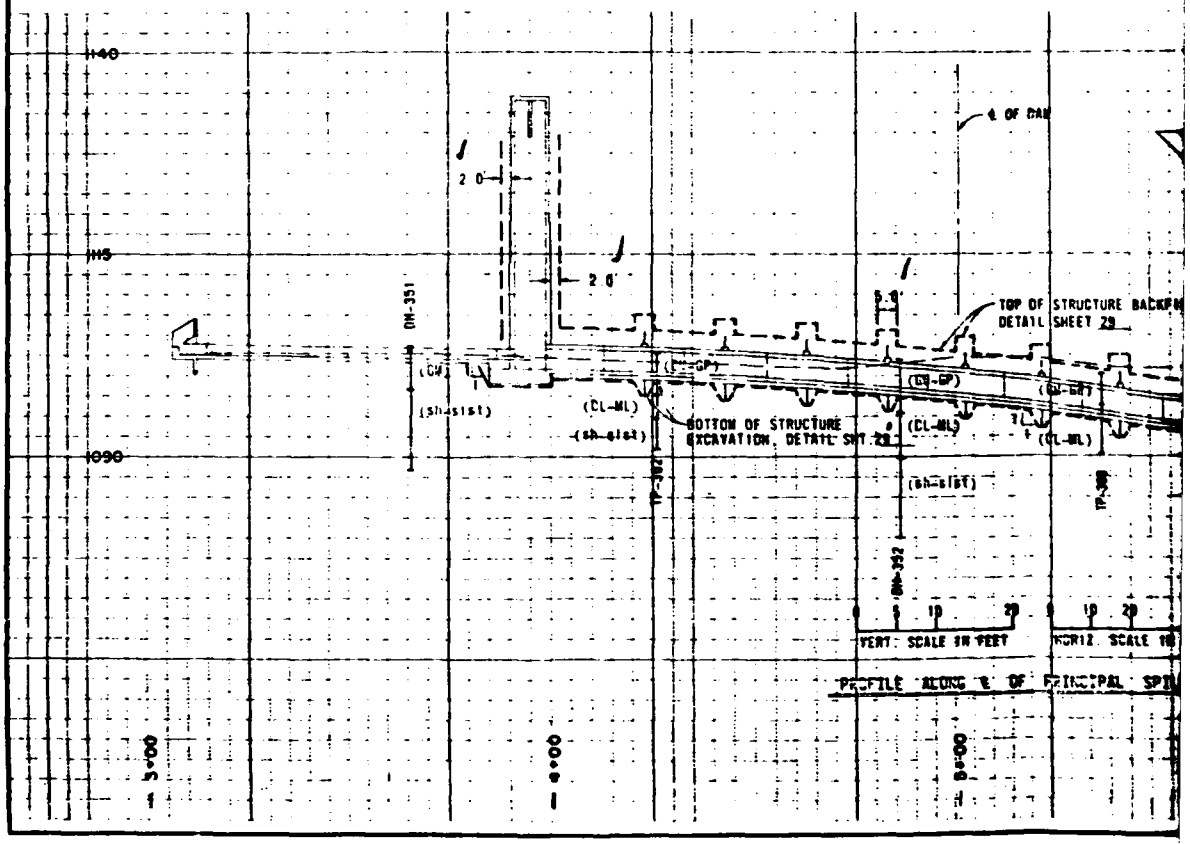
DRAWN BY	G. J. G.	CHECKED BY	WE	7/23/82	DRAWING NUMBER 80-778-B46
	5-27-81	APPROVED BY	JHD	7-24-82	

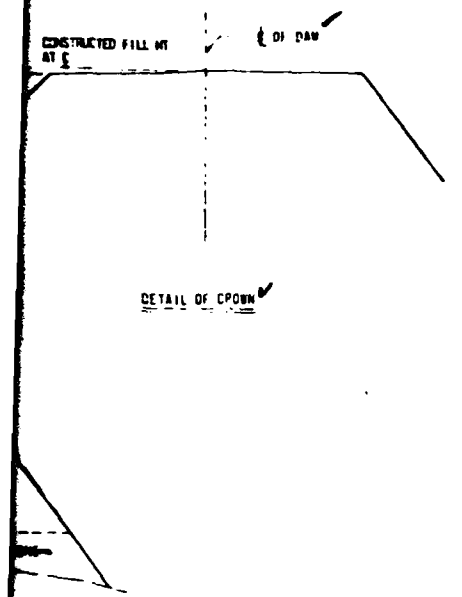


SECTION OF DAM AT STA 10+00

(TYPICAL FROM STA 5+40 TO 13+20)

(NOT TO SCALE)





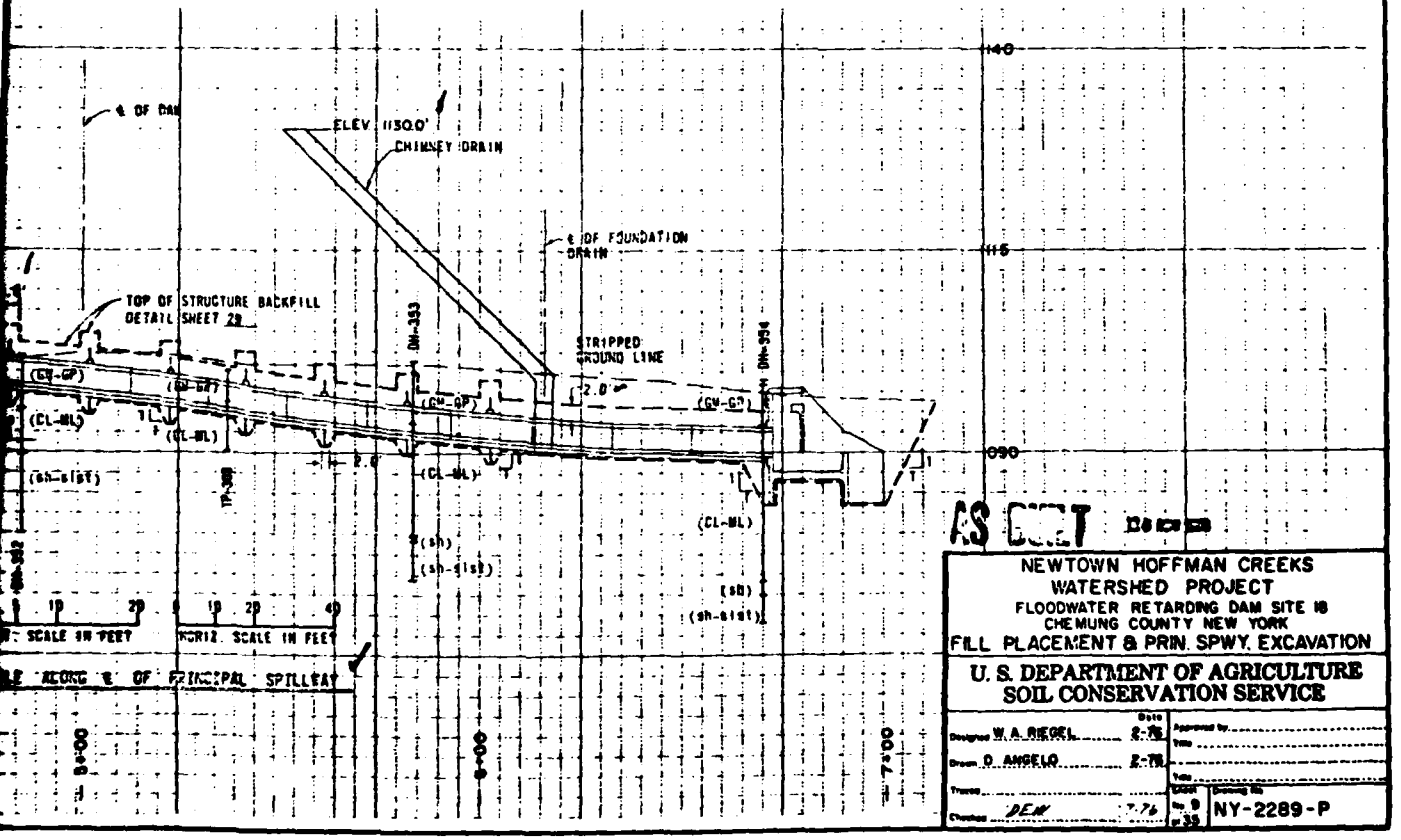
EARTH FILL REQUIREMENTS

MATERIAL 1 REPRESENTED BY THE FOLLOWING TEST PITS	MAXIMUM ROCK SIZE 2	MAXIMUM LIFT THICKNESS 3	REQUIRED WATER CONTENT 4	COMPACTION 5	
				CLASS	DEFINITION
GW-GC-GP TP-211 & TP-304 SC-SM TP-102 TP-227 SC-SW TP-501 TP-206	6"	9"	2% BELOW OPTIMUM TO 2% ABOVE OPTIMUM	A	98% OF MAXIMUM DENSITY BY ASTM-D698

1. THE PLACEMENT TABLE INDICATES ESTIMATED USE OF MATERIALS. MATERIALS WILL NOT BE SELECTIVELY PLACED OTHER THAN SPECIFIED BELOW FOR ROCK OVERSIZE, TOPSOIL AND STRUCTURE BACKFILL.
2. A) MAXIMUM ROCK SIZE IN STRUCTURE BACKFILL COMPACTED BY MEANS OF MANUALLY DIRECTED POWER TAMPERS OR PLATE TAMPERS SHALL BE 3".
   B) OVERSIZE MATERIAL (OVER 6") PLACED IN THE EARTHFILL SHALL BE RAKED TO THE PORTION OF THE DAM LABELED RANDOM ROCK ZONE AS SHOWN ON THE DRAWING.
3. MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION. THE MAXIMUM LIFT THICKNESS OF THE RANDOM ROCK SECTION SHALL BE NO GREATER THAN 24" PRIOR TO COMPACTION. MAX. ROCK SIZE SHALL BE 24".
4. WATER CONTENT AT TIME OF COMPACTION
5. USE CLASS "C" COMPACTION IN AREA OF THE DAM CONTAINING RANDOM ROCK MAT'L. CLASS 'C' COMPACTION SHALL CONSIST OF A MINIMUM OF THREE PASSES PER LIFT OF FILL BY A TAMPING ROLLER EXERTING A MINIMUM CONTACT OF 450 PSI, OR EQUIVALENT, AS APPROVED BY THE ENGINEER. FOR LOGS OF TEST HOLES SEE SHEETS 30 TO 35.
6. MATERIAL CONTAINING LESS THAN 15% FINES SHALL BE WASTED OR PLACED IN THE COARSE ZONE INDICATED ON THE SECTION

CONSTRUCTION DETAILS

1. RANDOM ROCK ZONE BOUNDARY IS APPROXIMATE. ADJUSTMENTS WILL BE MADE BY THE ENGINEER TO UTILIZE AVAILABLE MATERIAL
2. MATERIAL PLACED IN THE RANDOM ROCK ZONE SHALL CONSIST OF ROCK EXCAVATION FROM THE EMERGENCY SPILLWAY AND OVERSIZE MATERIAL RAKED FROM THE EARTH FILL
3. TOPSOIL THAT IS SUITABLE FOR USE AND NOT USED IN THE SPECIFIED AREAS OF THE EMERGENCY SPILLWAY SHALL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER. THE SOURCE OF THE TOPSOIL SHALL BE WITHIN THE REQUIRED EXCAVATION
4. THE LIMITS OF STRUCTURE BACKFILL WILL BE MEASURED TO OUTSIDE FACE OF RISER AT MAXIMUM WALL THICKNESS AS SHOWN ON THIS SHEET



AS BUILT

NEWTOWN HOFFMAN CREEKS WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE #8
CHEMUNG COUNTY NEW YORK
FILL PLACEMENT & PRIN. SPWY. EXCAVATION

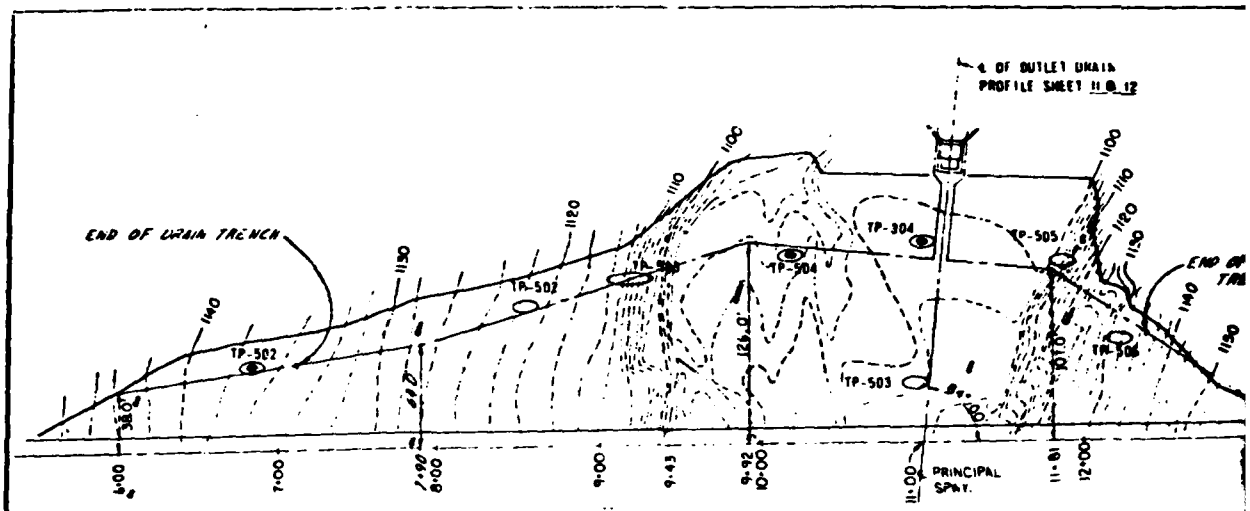
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed W. A. RIEGEL	Date 2-76	Approved by	
Drawn D. ANGELO	2-76	Title	
Traced		Title	
Checked DEM	2-76	Sheet No. 9 of 35	Drawing No. NY-2289-P

PLATE 3

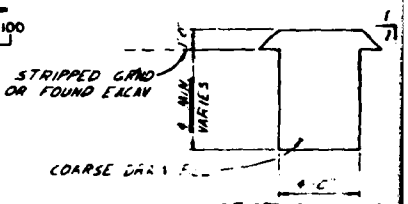
D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	BE	7/24/81	DRAWING NUMBER 80-778-B47
	5-28-81	APPROVED BY	[illegible]	7-24-81	

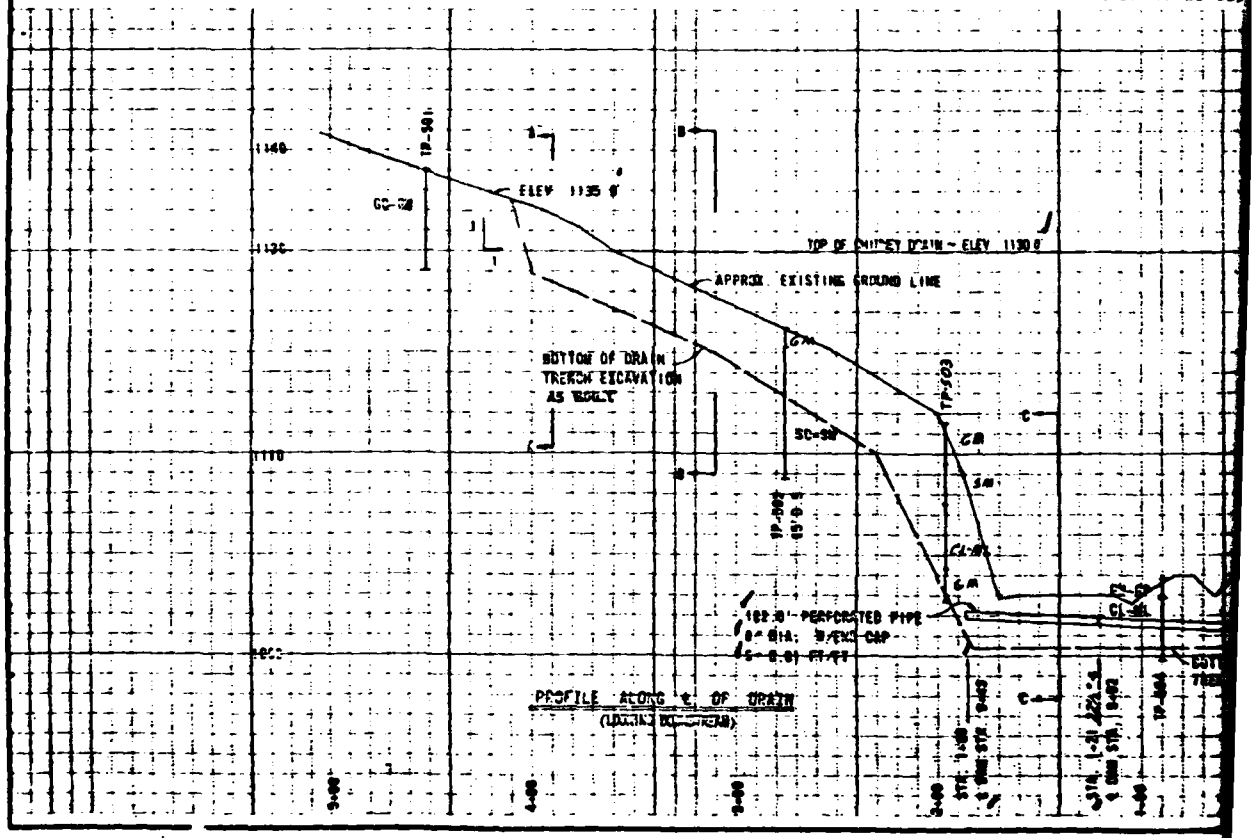


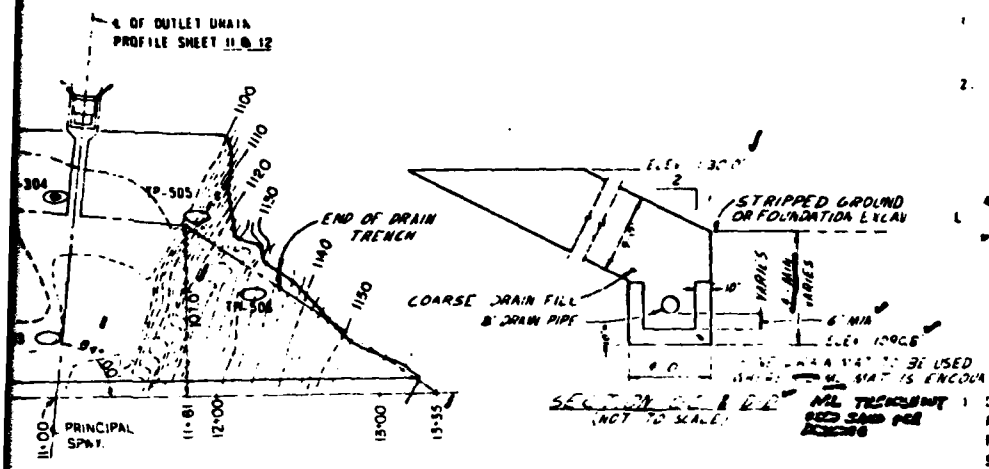
PLAN VIEW

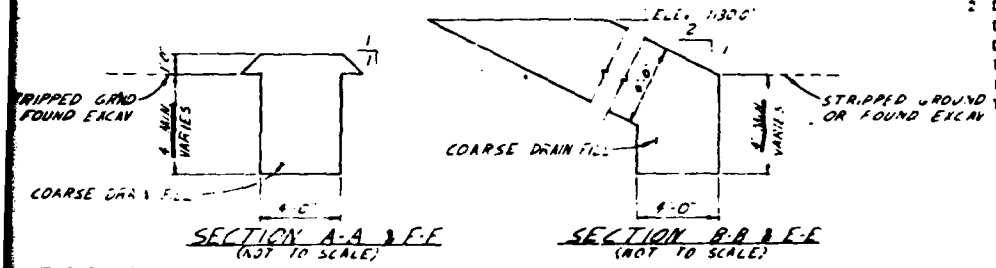
0 25 50 100
SCALE IN FEET



SECTION A-A
(NOT TO SCALE)







DRAINAGE SYSTEM DETAILS

1. ASBESTOS-CEMENT DRAIN PIPE SHALL CONFORM TO SPECIFICATION 545 AND SHALL BE 8 INCH DIA PRESSURE PIPE CLASS 200
2. PROFILES AT THE BOTTOM OF ALL EXCAVATIONS ARE APPROXIMATE. THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

ESTIMATED QUANTITIES

100 CU YDS. DRAINFILL I (FINE)
4500 CU. YDS. DRAIN FILL II (COARSE)
12 LIN.FT. NON-PERF ASBESTOS CEMENT PIPE
378 LIN. FT. STRAIGHT SECTIONS ASBESTOS CEMENT PIPE (8" DIA.) PERFORATED
1 22½ ELBOW (8 DIA CAST IRON)
2 90° ELBOWS (8" DIA. CAST IRON)
4 45° ELBOWS (8" DIA. CAST IRON), 2 END CAPS

GRAIN SIZE DISTRIBUTION FOR DRAIN FILL

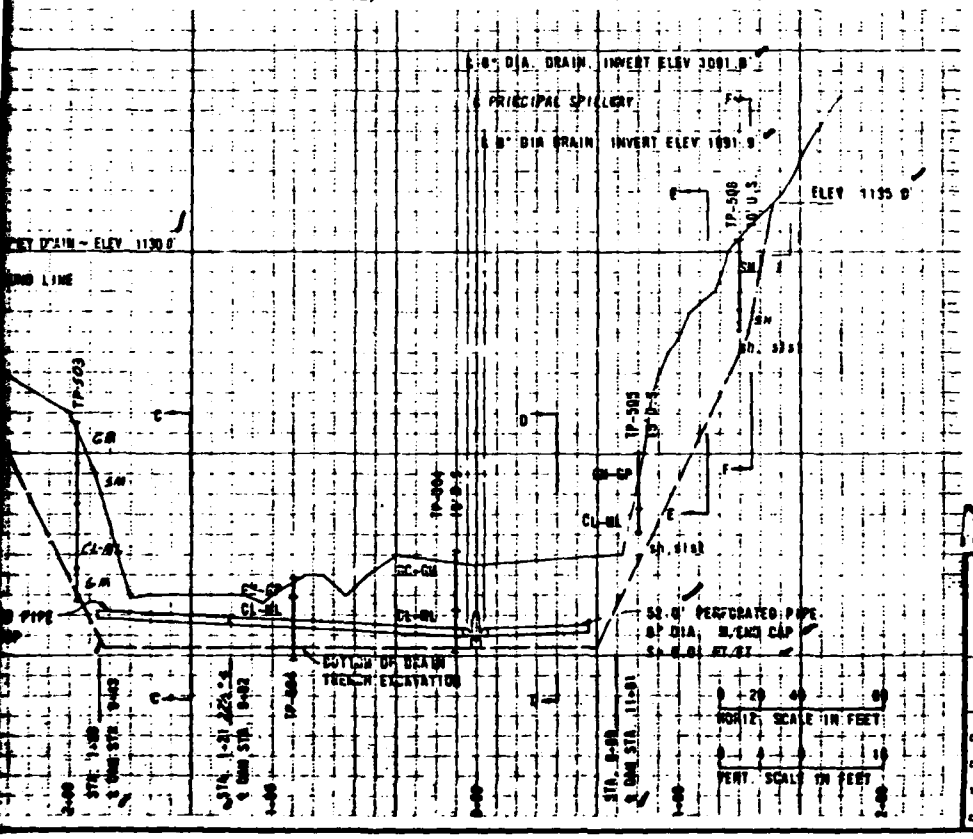
1 DRAIN FILL I (FINE) SHALL MEET THE GRADATION OF ASTM C33-67 FOR FINE AGGREGATE IN ADDITION, THE PERCENTAGE OF MATERIAL FINER THAN A # 200 SIEVE SHALL NOT BE MORE THAN 3%.

2 DRAIN FILL II (COARSE) SHALL MEET THE GRADATION OF SIZE DESIGNATION 1, AS [illegible] IN TABLE 703-4 OF THE JAN 2, 1973 STANDARD SPECIFICATIONS OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION IN ADDITION, THE PERCENTAGE OF MATERIAL FINER THAN A #200 SIEVE SHALL NOT BE MORE THAN 3%

TABLE 703-4

SCREEN SIZE	% PASSING
¼	0-15
½	90-100
1	100

ACTUAL "DIGOUT" TRENCH



AS BUILT

NEWTOWN HOFFMAN CREEKS WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 18
CHEMUNG COUNTY NEW YORK
DRAINAGE SYSTEM

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

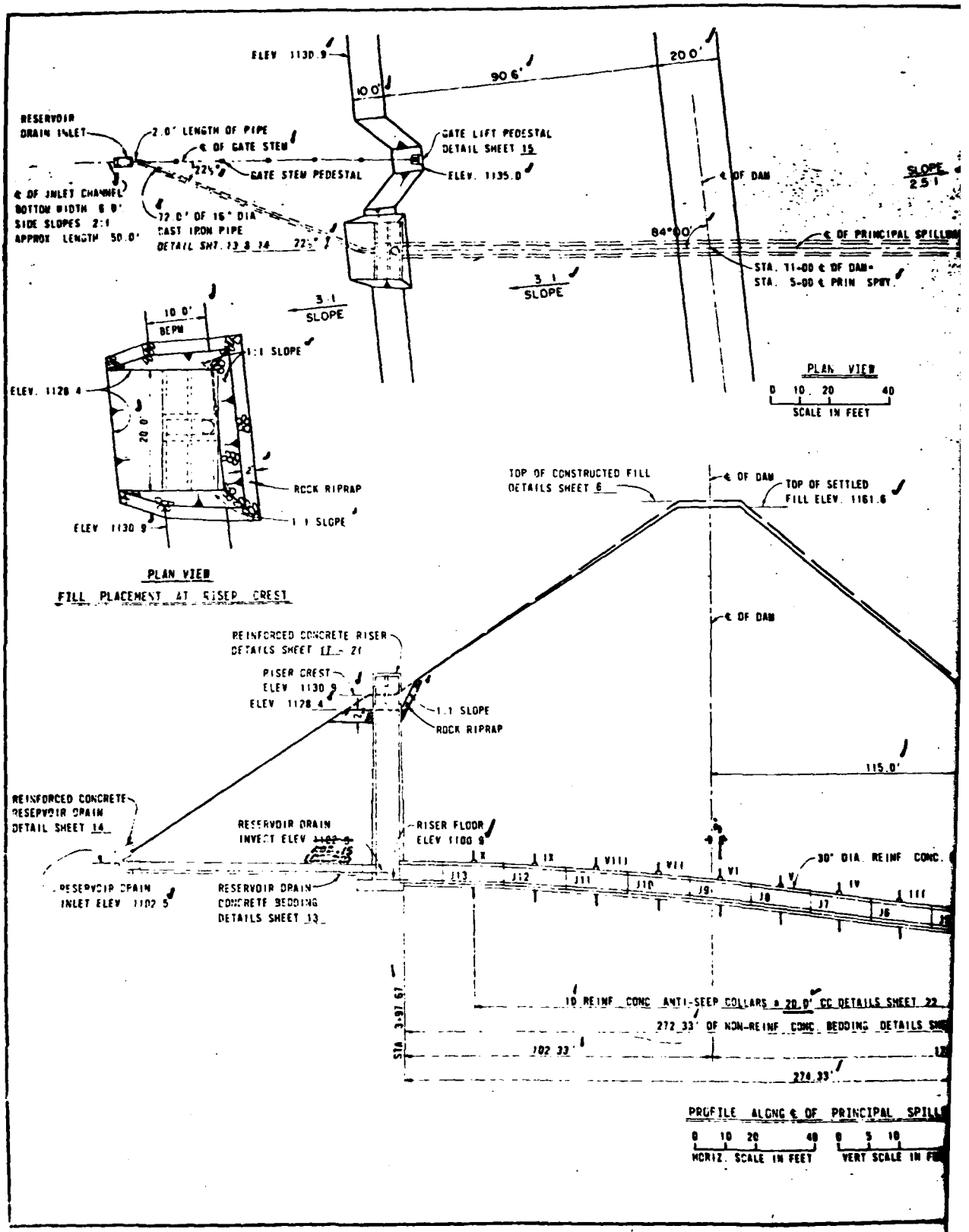
Designed W. A. RIEGEL	Date 12-72	Approved by	
Drawn D. ANGELO	12-72	Title	
Traced		Title	
Checked O. E. W.	7-73	Sheet No. 10 of 33	Drawing No. NY-2289-P

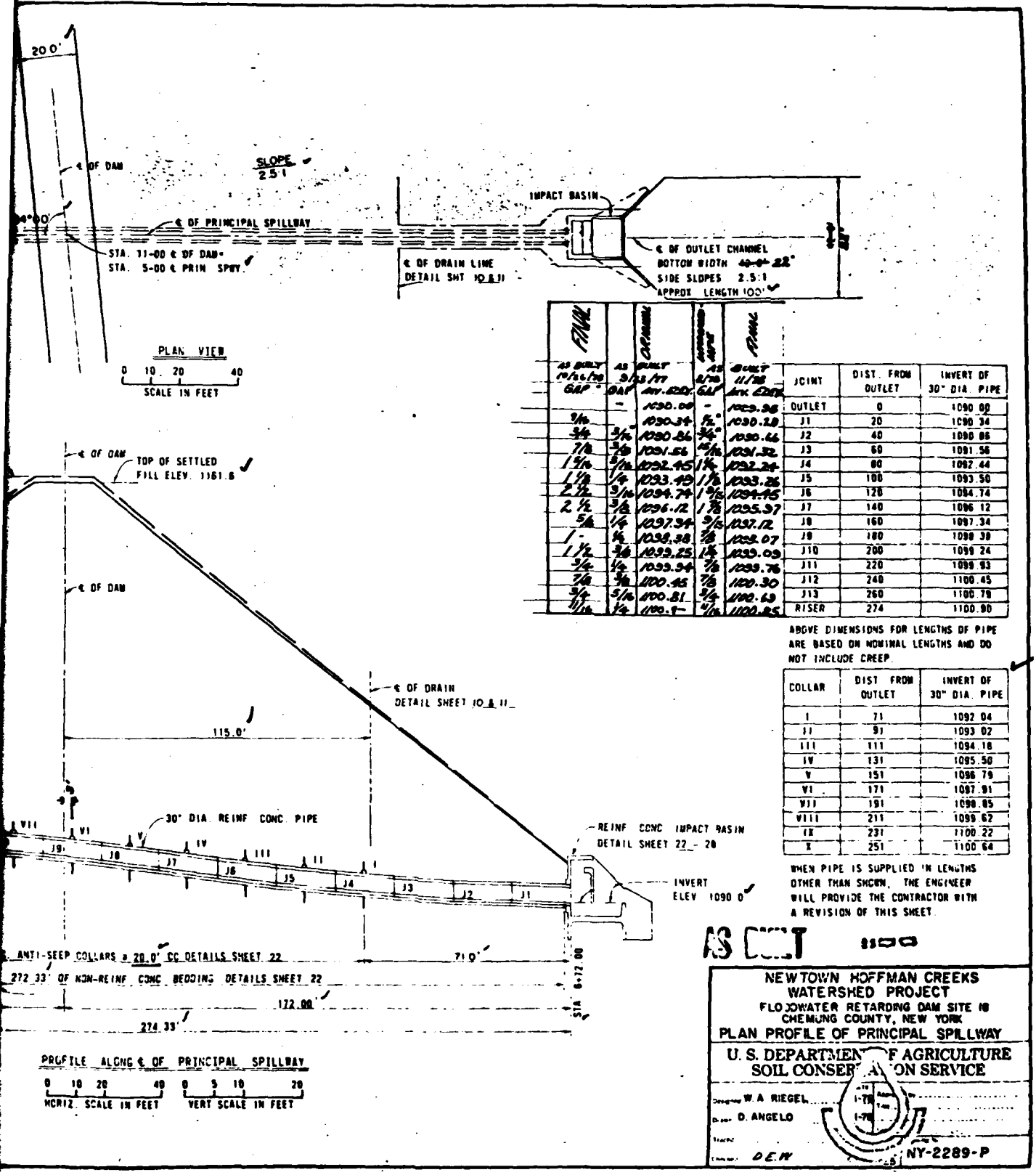
PLATE 4

D'APPOLONIA

2

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
5-27-81	G.J.G.	JHP	80-778-B48





FILL AS BUILT 10/26/78 GAP "	CHANNEL AS BUILT 9/28/77 GAP	CHANNEL AS BUILT Apr. 1980 GAP	APPROACH APRON AS BUILT 6/78 GAP	FILL AS BUILT 11/78 Mark Date	JOINT	DIST. FROM OUTLET	INVERT OF 30" DIA. PIPE
	-	1090.00	-	1089.96	OUTLET	0	1090.00
3/16	-	1090.34	1/16"	1090.28	J1	20	1090.34
3/4	3/16	1090.84	3/4"	1090.46	J2	40	1090.86
7/8	3/8	1091.56	15/16	1091.32	J3	60	1091.56
1 5/16	5/16	1092.45	1 1/4	1092.24	J4	80	1092.44
1 1/8	1/4	1093.49	1 1/8	1093.26	J5	100	1093.50
2 1/2	3/16	1094.74	1 5/16	1094.45	J6	120	1094.74
2 1/2	3/8	1096.12	1 7/8	1095.97	J7	140	1096.12
5/8	1/4	1097.34	9/16	1097.12	J8	160	1097.34
1 -	1/4	1098.38	7/8	1098.07	J9	180	1098.38
1 1/2	3/8	1099.25	1 1/4	1099.09	J10	200	1099.24
3/4	1/4	1099.94	7/8	1099.76	J11	220	1099.93
7/8	5/16	1100.45	7/8	1100.30	J12	240	1100.45
3/4	5/16	1100.81	3/4	1100.69	J13	260	1100.79
11/16	1/4	1100.9-	11/16	1100.85	RISER	274	1100.90

ABOVE DIMENSIONS FOR LENGTHS OF PIPE ARE BASED ON NOMINAL LENGTHS AND DO NOT INCLUDE CREEP.

COLLAR	DIST. FROM OUTLET	INVERT OF 30" DIA. PIPE
I	71	1092.04
II	91	1093.02
III	111	1094.18
IV	131	1095.50
V	151	1096.79
VI	171	1097.91
VII	191	1098.85
VIII	211	1099.62
IX	231	1100.22
X	251	1100.64

WHEN PIPE IS SUPPLIED IN LENGTHS OTHER THAN SHOWN, THE ENGINEER WILL PROVIDE THE CONTRACTOR WITH A REVISION OF THIS SHEET.

AS BUILT

NEWTOWN HOFFMAN CREEKS WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 18
CHEMUNG COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed W. A. RIEGEL 1-78
Drawn D. ANGELO 1-78
Traced
Checked D.E.W.

NY-2289-P

PLATE 5

D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	[illegible]	7/28/81	DRAWING NUMBER 80-778-B49
	5-27-81	APPROVED BY	[illegible]	7-24-81	

TP #210, Left Emer. Spillwy, 8/19/71, DBC, 1[illegible]

0.0 - 0.8 Topsoil, brown

0.8 - 12.0 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 2.5', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #211, Left Emer, Spillwy, 8/17/71, DBC, 1178

0.0 - 0.8 Topsoil, brown

0.8 - 16.0 Sand, silty, clayey, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3' then moist; impermeable; dense; homogeneous; glacial till; (SC-SM)

NOTE: No seepage.

TP #212, Left Emer. Spillwy, 8/19/71, DBC, 1[illegible]72

0.0 - 0.9 Topsoil, brown

0.9 - 10.0 Gravel, silty, sandy
Max. size 16", flaggy siltstone
Approx. 2% +6", 3% 3-6", 95% matrix (which is approx. 35% gravel, 25% sand, 40% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (GM)

NOTE: No seepage.

TP #213, Left Emer. Spillwy, 8/18/71, DBC, 1[illegible]822

0.0 - 0.8 Topsoil, brown

0.8 - 16.0 Sand, silty, gravelly
Max. size 9", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 30% gravel, 35% sand, 35% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #214, Left Emer. Spillwy, 8/18/71, DBC, 1[illegible]802

0.0 - 0.8 Topsoil, brown

0.8 - 8.0 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #215, Left Emer. Spillwy, 8/20/71, DBC, 1[illegible]735

0.0 - 0.8 Topsoil, brown

0.8 - 17.0 Sand, silty, gravelly or silt, sandy, gravelly
Max. size 14", flaggy siltstone
Approx. 2% +6", 2% 3-6", 96% matrix (which is 20% gravel, 30% sand, 50% slightly plastic fines)
Brown to 13', then gray; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM or ML)

NOTE: No seepage.

TP #216, Left Emer, Spillwy, 8/18/71, DBC, 1[illegible]920

0.0 - 0.8 Topsoil, brown

0.8 - 16.0 Sand, silty, gravelly
Max. size 15", flaggy siltstone
Approx. 2% +6", 2% 3-6", 96% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #217, Left Emer. Spillwy, 8/18/71, DBC, 1[illegible]657

0.0 - 0.8 Topsoil, brown

0.8 - 13.0 Sand, silty, gravelly
Max. size 27", flaggy siltstone
Approx. 4% +6", 2% 3-6", 94% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry to 2.5', then moist; impermeable; dense; homogeneous; glacial till; (SM)

13.0 - 16.0 Gravel, sandy, w/silt
Max. size 12", SR siltstones
Approx. 4% +6", 6% 3-6", 90% matrix (which is approx. 55% gravel, 30% sand, 15% slightly plastic fines)
Brown; moist to 14.5', then wet; slightly to moderately permeable; medium density; homogeneous; alluvial or glacio-fluvial; (GM)
D.S. 217.1 @ 14-15', GC-GM-GP

NOTE: Slight seepage @ 14.5' causes sloughing and caving.

TP #218, Left Emer. Spillwy, 8/20/71, DBC, 1[illegible]875

0.0 - 0.8 Topsoil, brown

0.8 - 17.2 Sand, silty, gravelly
Max. size 15", flaggy siltstone
Approx. 2% +6", 3% 3-6", 95% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown to gray @ 14'; dry to 2', then moist; impermeable; dense; homogeneous; glacial till; (SM).

NOTE: No seepage.

TP #219, Left Emer. Spillwy, 8/20/71, DBC, 1[illegible]559

0.0 - 0.8 Topsoil, brown

0.8 - 16.0 Sand, silty, gravelly
Max. size 9", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry to 3.3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #220, Left Emer. Spillwy, 8/19/71, DBC, 1[illegible]85

0.0 - 0.8 Topsoil, brown

0.8 - 13.7 Sand, silty, gravelly
Max. size 16", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #221, Left Emer. Spillwy, 8/20/71, DBC, 1[illegible]47

0.0 - 0.8 Topsoil, brown

0.8 - 7.0 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry to 2.5', then moist; impermeable; dense; homogeneous; glacial till; (SM)

NOTE: No seepage.

TP #222, Right Emer. Spillwy, 8/23/71, DBC, 1[illegible]628

0.0 - 0.7 Topsoil, brown

0.7 - 3.0 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

3.0 - 7.0 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh)

7.0 Moderately weathered to unweathered bedrock (shale and siltstone)
Gray; moderately soft to hard; highly fractured; thin bedded; (sh; slst)

NOTE: No seepage. Refusal @ 7.0' with large hoe.
Very difficult to accurately delineate a till-weathered rock boundary, descrip gradational to the eye

TP #229, Right Emergency Spillway, 8/23/71, DSC, 1165.7

0.0 - 0.7 Topsoil, brown

0.7 - 4.0 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

4.0 - 9.0 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh)

9.0+ Moderately weathered to unweathered bedrock (shale and siltstone)
Grey; moderately soft to hard; highly fractured; thin bedded; (sh,slst)

NOTE: No seepage. Refusal @ 9' with large hem. Till-weathered rock boundary vague.

TP #226, Right Emergency Spillway, 8/23/71, DSC, 1160.6

0.0 - 0.7 Topsoil, brown

0.7 - 6.0 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

6.0 - 7.5 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh).

7.5 Moderately weathered to unweathered bedrock (shale and siltstone).
Grey; moderately soft to hard; highly fractured; thin bedded; (sh, slst)

NOTE: No seepage. Refusal @ 7.5' with large hem.

TP #225, Right Emergency Spillway, 8/10/71, DSC, 1184.9

0.0 - 0.7 Topsoil, brown

0.7 - 3.0 Sand, silty, gravelly
Max. size 9", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

3.0 - 10.0 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh)

10.0 Moderately weathered to unweathered bedrock (shale and siltstone)
Grey; moderately soft to hard; highly fractured; thin bedded; (sh, slst)

NOTE: No seepage. Refusal @ 10' with large hem.

TP #224, Right Emergency Spillway, 8/23/71, DSC, 1180.6

0.0 - 0.6 Topsoil, brown

0.6 - 7.5 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

7.5 Moderately weathered to unweathered bedrock (shale and siltstone)
Grey; moderately soft to hard; highly fractured; thin bedded; (sh, slst)

NOTE: No seepage. Refusal @ 7.5' with large hem.

TP #227, Right Emergency Spillway, 8/10/71, DSC, 1173.1

0.0 - 0.8 Topsoil, brown

0.8 - 11.5 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)
D.S. 227.1 @ 4', SC-SM

11.5+ Unweathered bedrock (shale and siltstone)
Grey; hard; little fracturing; thin bedded; (sh and slst)

NOTE: No seepage. Refusal @ 11.5' with large hem.

TP #228, Right Emergency Spillway, 8/23/71, DSC, 1146.2

0.0 - 0.7 Topsoil, brown

0.7 - 13.0 Sand, silty, gravelly
Max. size 9", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

13.0+ Moderately weathered bedrock (shale and siltstone)
Grey; hard; little fracturing; thin bedded; (sh; slst)

NOTE: No seepage. Refusal @ 13.0' with large hem.

TP #229, Right Emergency Spillway, 8/10/71, DSC, 1157.6

0.0 - 0.8 Topsoil, brown, dry

0.8 - 8.0 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

8.0 - 11.0 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh).

11.0+ Moderately weathered bedrock
Grey; hard; highly fractured; thin bedded; (sh,slst).

NOTE: No seepage. Refusal @ 11' with large hem.

TP #230, Right Emergency Spillway, 8/23/71, DSC, 1170.9

0.0 - 0.7 Topsoil, brown

0.7 - 6.5 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

6.5 - 8.0 Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh).

8.0+ Moderately weathered to unweathered bedrock (shale and siltstone)
Grey; moderately soft to hard; highly fractured thin bedded; (sh; slst)

NOTE: No seepage. Refusal @ 8' with large hem. Till-weathered rock boundary vague.

TP #231, Right Emergency Spillway, 8/23/71, DSC, 1201.0

0.0 - 0.7 Topsoil, brown, dry

0.7 - 3.5 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

3.5+ Unweathered bedrock (shale and siltstone)
Grey; hard; little fracturing; thin bedded; (sh and slst)

NOTE: No seepage. Refusal @ 3.5' with small hem.

TP #232, Right Emergency Spillway, 8/23/71, DSC, 1198.7

0.0 - 0.7 Topsoil, brown, dry

0.7 - 7.0 Sand, silty, gravelly
Max. size 10", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% slightly plastic fines)
Brown; dry; impermeable; dense; homogeneous; glacial till; (SM)

7.0+ Highly weathered bedrock (shale)
Brown; very soft; laminated to thin bedding often visible; soil-like; (sh)

NOTE: No seepage.

TP #233, Right Emergency Spillway, 8/23/71, DSC, 1209.7

0.0 - 0.7 Topsoil, brown, dry

0.7 - 5.0 Sand, silty, gravelly
Max. size 12", flaggy siltstone
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 30% sand, 45% slightly plastic fines)
Brown; dry to 3', then moist; impermeable; dense; homogeneous; glacial till; (SM)

5.0+ Unweathered bedrock (shale and siltstone)
Grey; hard; little fracturing; thin bedded; (sh and slst)

NOTE: No seepage. Refusal @ 5.0' with large hem.

AS BUILT

NEWTOWN-HOFFMAN CREEKS
WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 18
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged Date
Title GEOLOGIST
Typed
Approved STATE CONS. ENGINEER
Sheet 31 of 38
NY-2289-P

PLATE 6

D'APPOLONIA

DRAWN BY	G.J.G.	CHECKED BY			DRAWING NUMBER 80-778-B 50
	5-27-81	APPROVED BY			

EXCAVATION-HOFFMAN SITE 18

DRILL HOLE LOGS

DH51, C/L Dam, 8/25/71, DBC, 1134.5

0.0 Topsoil, brown, dry

BH 53 BH 37 — Sand, gravelly, silty, clayey; well graded; est. 25% gravel, 30% sand, 45% fines; slightly plastic; brown, dry to 2.5', then moist; slight permeability; dense to very dense, N=37-53; homogeneous; glacial till; (SM)

11.4

BH 26 33 26 100/.6 BH 31 33 53 98 BH 48 100/.4 BH 66 — Silt and clay, sandy, gravelly; poorly graded; est. 15% gravel, 20% sand, 65% fines; slightly plastic; gray; moist; impermeable; very stiff to hard, N=26-100/.4; mostly homogeneous, but occasional clayey lenses; glacial till; (CL-ML)

37.0 EOH

NOTE: Water level @ 3.0', caved @ 6.1' (9/1/71).

DH52, C/L Dam, 9/1/71, DBC, 1120.1

1.0 Topsoil, brown, dry

29 50/.4 BH 117 86 54 49 — Sand, gravelly, silty, clayey; well graded; est. 25% gravel, 35% sand, 40% fines; slightly plastic; brown; dry to 2.5', then moist; slight permeability; medium to very dense, N=29-117; homogeneous; glacial till; (SM)

11.9

54 35 25 39 44 54 BH 69 BH 39 BH 39 37 BH 69 BH 36 — Silt and clay; w/sand and gravel; poorly graded; est. 20% gravel, 20% sand, 60% fines; slightly plastic; gray; moist; impermeable; very stiff to hard, N=25-69; mostly homogeneous, but occasional clayey lenses; glacial till; (CL-ML)

32.0 EOH

NOTE: No water level observed.

DH53, C/L Dam, 9/2-9/3/71, DBC, 1099.6

21 39 34 36 21 11 22 32 25 39 26 BH 22 BH 57 BH 110/.0 — Silt and clay, w/sand and gravel; poorly graded; est. 15% gravel, 15% sand, 70% fines; slightly to moderately plastic; gray; moist; impermeable; stiff to hard, N=11-57; mostly homogeneous, but occasional clayey lenses; glacial till; (CL-ML)

34.0

DH53 (cont'd.)

RX 100% rec. 0% RQD — Shale and siltstone; silty texture; mostly unweathered; gray; moderately soft to hard; laminated bedding; longest core length, 3½", most fractures are on 1-2" spacing; some vertical fractures or joints; essentially horizontal; fair core; Chemung fm., Devonian; (sh and slst)

49.0 EOH

NOTE: Water level at surface due to artesian pressure encountered near bedrock. Run 1, 34.0-49.0', 100% rec., 0% RQD.

DH54, C/L Dam, 9/7/71, DBC, 1098.9

0.9 Flaggy siltstone cobbles in creek-bed

57 30 40 35 20 15 11 12 10 17 16 17 50 BH 20 — Silt and clay, sandy, gravelly; poorly graded; est. 15% gravel, 15% sand, 70% fines; slightly plastic; gray; moist; impermeable; stiff to hard, N=10-57; mostly homogeneous, but occasional clayey lenses; glacial till; (CL-ML)

32.0

RX 90% rec. — Shale and siltstone; silty texture; moderately weathered; brown to gray; moderately soft to hard; laminated bedding; highly fractured, spacing < 1"; essentially horizontal; poor core; Chemung fm, Devonian; (sh and slst)

33.0

17% RQD — Shale and siltstone; silty texture; moderately weathered; gray; moderately to very hard; laminated bedding; longest core length 6", mostly 1-6" fracture spacing; essentially horizontal; poor core; Chemung fm, Devonian; (sh and slst)

37.0 EOH

NOTE: Water level @ 1.0' (9/7/71). Run 1, 32.0-37.0', 90% rec, 17% RQD.

DH55, C/L Dam, 8/31/71, DBC, 1129.3

33 — Sand, silty, gravelly; well graded; est. 25% gravel, 35% sand, 40% fines; slightly plastic; brown; dry; slight permeability; dense, N=33; homogeneous; glacial till; (SM)

2.2

106/.8 — Highly weathered bedrock(shale); brown; moist; almost soil-like; Chemung fm., Devonian; (sh)

4.5

RX 80% rec. 0% RQD — Shale and siltstone; silty texture; highly weathered and fractured; brown to gray; moderately soft to hard; laminated bedding; longest core length 2", most < 1"; occasional clay seam; essentially horizontal; very poor core; Chemung fm., Devonian; (sh and slst)

9.5

RX 100% rec. 7% RQD — Shale and siltstone; silty texture; mostly moderately weathered to 16.4' and highly fractured, then unweathered below; brown to gray @ 16.4'; moderately soft to hard above 16.4', hard below; laminated bedding; longest core above 16.4' is 2", and 4" below; fracture spacing generally ½-1½"; essentially horizontal; fair core above 16.4', good below; Chemung fm., Devonian; (sh and slst)

19.5

iltstone; silty texture; thered; gray; moderately ; laminated bedding; n length, 3½", most frac- n 1-7" spacing; some ver- ows or joints; essentially fair core; Chemung fm., sh and slst)

at surface due to artesian countered near bedrock. Run .0', 100% rec., 0% RQD.

1098.3

stone cobbles in creek-bed

ay, sandy, gravelly; poorly e. 15% gravel, 15% sand, 70% ghtly plastic; gray; moist; ; stiff to hard, N=10-57; ogeneous, but occasional clayey cial till; (CL-ML)

iltstone; silty texture; weathered; brown to gray; soft to hard; laminated ighly fractured, spacing < 1"; y horizontal; poor core; , Devonian; (sh and slst)

iltstone; silty texture; weathered; gray; moderately ard; laminated bedding; longest h 6", mostly 1-6" fracture essentially horizontal; poor ung fm, Devonian; (sh and slst)

@ 1.0' (9/7/71). Run 1, , 90% rec, 17% RQD.

, 1129.7

ty, gravelly; well graded; gravel, 35% sand, 40% fines; plastic; brown; dry; slight ity; dense, N=33; homogeneous; till; (SM)

thered bedrock(shale); brown; ost soil-like; Chemung fm., (sh)

tstone; silty texture; red and fractured; brown rately soft to hard; lam- g; longest core length 2", sional clay seam; essen- tally very poor core; Devonian; (sh and slst)

stone; silty texture; ely weathered to 16.4' and ed, then unweathered below; @ 16.4'; moderately soft 16.4', hard below; laminated e core above 16.4' is 2", acture spacing generally ly horizontal; fair core d below; Chemung fm., d slst)

DH255 (cont.)

50		
25		
38		
42		Silt,and clay, sandy, gravelly; poorly graded: est. 15% gravel, 25% sand, 60% fines: slightly plastic: gray: moist; impermeable: very stiff to hard, N=25-91; mostly homogeneous; glacial till; (CL-ML)
BH		
100/.2		
BH		
91		
BH		
59		
67		
80/.2		
BH		
	35.0	
	EOH	
	NOTE:	Water level @ 9.3', caved @ 10.8', (9/1/71)

DH256, Left Emergency Spillwy, 8/30-8/31/71, DBC, 1179.3

	1.0	Topsoil, brown, dry
BH		Sand, silty and clayey, gravelly; well
32		graded; est. 20% gravel, 35% sand, 45%
BH		fines; slightly plastic; brown; dry to
72		2.5', then moist; slight permeability;
BH		dense to very dense, N=32-72; homogeneous;
59		glacial till; (SC-SM)
35		
	18.5	
39		
36		
59		
62		
56		Silt and clay, sandy, gravelly; poorly
66		graded: est. 15% gravel, 25% sand, 60%
48		fines; slightly plastic; gray; moist; im-
80/.1		permeable; very stiff to hard, N=28-99;
BH		mostly homogeneous; glacial till; (CL-ML)
47		
28		
32		
38		
90		
69		
	47.0	
	EOH	
	NOTE:	Water level @ 8.9', caved @ 11.9' (9/1/71).

DH255, Left Emergency Spillwy, 8/26/71, DBC, 1173.9

	1.0	Topsoil, brown, dry
BH		Sand, silty and clayey, gravelly; well
39		graded; est. 20% gravel, 35% sand, 45%
BH		fines; slightly plastic; brown; dry to
24		2.5', then moist; slight permeability;
BH		medium to dense, N=24-39; homogeneous;
		glacial till; (SC-SM)
	13.5	
100/.2		
BH		
54		
60		Silt and clay, sandy, gravelly; poorly
75		graded; est. 15% gravel, 25% sand, 60%
51		fines; slightly plastic; gray; moist; im-
60/.1		permeable; hard, N=51-104/.6; mostly
BH		homogeneous; glacial till; (CL-ML)
104/.6		
BH		
80		
	31.0	
	EOH	NOTE: Water level @ 7.6', caved @8.0', (9/1/71).

DH253, Left Emergency Spillwy, 8/30/71, DBC, 1181.1

	1.0	Topsoil, brown, dry
BH		Sand, silty and,clayey; gravelly; well grad-
52		ed; est. 20% gravel, 35% sand, 45% fines;
BH		slightly plastic; brown; dry to 2', then
45		moist; slight permeability; dense to very
BH		dense, N=39-52; homogeneous; glacial till;
39		(SC-SM)
	17.0	

DH252, Left Emergency Spillwy, 8/27/71, DBC, 1171.7

	1.0	Topsoil, brown, dry
BH		Sand, silty & clayey, gravelly; well graded;
47		est. 20% gravel, 35% sand, 45% fines; slightly
BH		plastic; brown; dry to 2.5', then moist;
52		slight permeability; dense to very dense,
BH		N=46-66; homogeneous; glacial till; (SM-SC)
46		
66		
40/.2		
BH		
48		
	22.6	
		Silt and clay, sandy, gravelly; poorly grad-
		ed; est. 15% gravel, 20% sand, 65% fines;
31		slightly plastic; gray; moist; impermeable;
120		hard, N=31-120; mostly homogeneous, some
		clay lenses; glacial till; (CL-ML)
	27.0	
	EOH	
	NOTE:	Water level @ 7.3', also caved @ 7.3' (9/1/71)

DH251, Left Emergency Spillwy, 8/25-8/26/71, DBC, 1152.7

	1.0	Topsoil, brown, dry
		Sand, gravelly, silty, clayey; well graded;
		est. 25% gravel, 30% sand, 45% fines;
BH		slightly plastic; brown; dry to 2.5', then
38		moist; slight permeability; dense, N=38;
		mostly homogeneous; glacial till; (SM-SC)
	7.0	
BH		
46		
BH		Silt and clay, sandy, gravelly; poorly
55		graded: est. 20% gravel, 20% sand, 60%
29		fines; slightly plastic; gray; moist; im-
30		permeable except in more gravelly zones;
43		hard, N=30-102; homogeneous except for
44		occasional clay or gravelly lenses; glacial
102		till; (CL-ML)
	27.0	
	EOH	
	NOTE:	Water level @ 0.0', caved but open to 3.6', Artesian flow of 3 gpm from 8/26/71 to 9/7/71 before hole filled by crew. Flow encountered @ 23'.

DH254 (cont.)

		Shale and siltstone: silty texture; mostly unweathered; gray; hard; laminated bedding; longest core piece 8", most ½ to 2" spacing; essentially horizontal; good core zones 19-19.5', 20.7-23.0', 25.5-29.0'; rest fair; Chemung fm., Devonian; (sh and slst)
100% rec. 47% RQD		
	29.0	
NX 95% rec. 20% RQD		Shale and siltstone: silty texture; unweathered; gray; hard; laminated bedding; longest core piece 6", most >2"; essentially horizontal; good core; Chemung fm., Devonian; (sh and slst)
	37.0	
	EOH	
	NOTE:	No water, open to 8' (9/7/71). Lost drill water @ 6' and never regained. Run 1, 4.5-9.5', 80% rec, 0% RQD 2, 9.5-19.5', 100% rec, 7% RQD 3, 19.5-29.0', 100% rec, 47% RQD 4, 29.0-37.0', 95% rec, 20% RQD

NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 18
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged by [illegible] Date [illegible]
Title GEOLOGIST
Typed [illegible]
Checked [illegible]
Approved by Robert L. Phillips
Title STATE CONS. ENGINEER
Date [illegible]
Drawing No. 33 NY-2289-P
Sheet No. 33

PLATE 7

D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	JJE	7/28/81
	5-27-81	APPROVED BY	J.HP	7-29-81

DRAWING NUMBER 80-778-851

DH254, Left Emergency Spillway, 8/25/71, DBC, 1165.9

	0.7	Topsoil, brown, dry
38 BH 45 41 85 53 69		Sand, silty & clayey, gravelly; well graded; est. 20% gravel, 40% sand, 40% fines; slightly plastic; brown; dry to 2.5', then moist; slight permeability; dense to very dense; N=38-85; homogeneous; glacial till; (SC-SM)
	21.0	
45 46 65		Silt and clay, sandy, gravelly; poorly graded; est. 15% gravel, 25% sand, 60% fines; slightly plastic; gray; moist; slightly permeable; hard, N=45-65; mostly homogeneous; glacial till; (CL-ML)
	26.0	
	EOH	

NOTE: Water level @ 10.0', caved @ 11.0', (9/2/71). Free water @ 14.0'.

DH257, Right Emergency Spillway, 9/3-9/7/71, DBC, 1159.9

	1.5	Topsoil, brown, dry
15 116 93 100/.4 RB		Highly weathered bedrock (shale); brown; dry almost soil-like; Chemung fm, Devonian; (sh)
	8.0	
NX 100% rec. 0% RQD		Shale and siltstone; silty texture; moderately weathered; brown to gray; moderately soft to hard; laminated bedding; longest core piece 3", most <1"; occasional clay seams; essentially horizontal; very poor core; Chemung fm., Devonian; (sh and slst)
	13.0	
NX 100% rec. 3% RQD		Shale and siltstone; silty texture; moderately weathered to 15', then unweathered; gray; hard; laminated bedding; longest core piece 4", most <2"; essentially horizontal; poor core, no really good zones; Chemung fm., Devonian; (sh and slst)
	22.8	
NX 100% rec. 0% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; highly fractured, usually <1" spacing; essentially horizontal; very poor core; Chemung fm., Devonian; (sh and slst)
	27.0	
	EOH	

NOTE: No water observed.
Run 1, 8.0-13.0', 100% rec., 0% RQD
2, 13.0-22.8', 100% rec., 3% RQD
3, 22.8-27.0', 100% rec., 0% RQD

DH258, Right Emergency Spillway, 9/2/71, DBC, 1178.0

48		Sand, silty & clayey, gravelly; well graded; est. 20% gravel, 40% sand, 40% fines; slightly plastic; brown; dry; slight permeability; dense; N=48; homogeneous; glacial till; (SC-SM)
	1.8	
100/.4		Highly weathered bedrock (shale); brown; moist; almost soil-like; Chemung fm., Devonian; (sh)
	2.4	
NX 100% rec. 0% RQD		Shale and siltstone; silty texture; highly weathered and fractured; brown; moderately soft to moderately hard; laminated bedding; fracture spacing <1", essentially horizontal; very poor core; Chemung fm., Devonian; (sh and slst)
	4.3	

DH258 (con't)

NX 95% rec. 0% RQD		Shale and siltstone; silty texture; moderately weathered and fractured; brown to gray; moderately hard; laminated bedding; largest core piece 2", most <1"; essentially horizontal; very poor core; Chemung fm., Devonian; (sh and slst)
	11.3	
NX 100% rec. 8% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; largest core piece 7", most 1-2"; essentially horizontal; poor core to 13', then fair; Chemung fm., Devonian; (sh and slst)
	19.2	
NX 100% rec. 7% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; largest core piece 6", most 1-2", essentially horizontal; fair core; Chemung fm., Devonian; (sh and slst)
	27.0	
NX 100% rec. 34% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; largest core piece 8", most 2-4" below 31', 1-2" above 31'; essentially horizontal; fair core to 31', then good; Chemung fm., Devonian; (sh and slst)
	37.0	
	EOH	

NOTE: Water level @ 26.0', caved @ 27.0,(9/7/71)
Run 1, 2.4-4.3', 100% rec. 0% RQD
2, 4.3-11.3', 95% rec. 0% RQD
3, 11.3-19.2', 100% rec. 8% RQD
4, 19.2-27.0', 100% rec. 7% RQD
5, 27.0-37.0', 100% rec. 34% RQD

DH259, Right Emergency Spillway, 8/31-9/1/71, DBC, 1169.8

106/.9		Sand, silty & clayey, gravelly; well graded est. 20% gravel, 40% sand, 40% fines; slightly plastic; brown; dry; slight permeability; dense; homogeneous; glacial till; (SC-SM)
	2.7	
RW 74/.5 BH 91 BH R6 50/.3 RB		Highly weathered shale; brown; moist; almost soil-like; Chemung fm., Devonian;(sh)
	9.5	
NX 100% rec. 18% RQD		Shale and siltstone; silty texture; moderately weathered; gray; hard; laminated bedding; largest core piece 5", most 1-2"; essentially horizontal; mostly very poor core, except good from 11.5-14.0', 17.0-19.0'; Chemung fm., Devonian; (sh and slst)
	19.0	
NX 100% rec. 16% RQD		Shale and siltstone; silty texture; mostly unweathered; gray; hard; laminated bedding; largest core piece 5", mostly 1-3"; essentially horizontal; good core; Chemung fm., Devonian; (sh and slst)
	29.0	
NX 100% rec. 38% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; largest core piece 5", most 1-3"; essentially horizontal; good core; Chemung fm., Devonian; (sh and slst)
	31.0	
	EOH	

NOTE: Water level @ 5.5', caved @ 6.5', (9/7/71)
Run 1, 9.5-19.0', 100% rec. 18% RQD
2, 19.0-29.0', 100% rec. 16% RQD
3, 29.0-31.0', 100% rec. 38% RQD
Pressure tests tabulated in narrative.

...tone; silty texture; mod-
...ed and fractured; brown to
...y hard; laminated bedding;
...ece 2", most <1"; essen-
...tial; very poor core; Chemung
... (sh and slst)

...tone; silty texture; un-
...y; hard; laminated bedding;
...ece 7", most 1-2"; essen-
...tial; poor core to 13', then
...fm., Devonian; (sh and slst)

...tone; silty texture; un-
...y; hard; laminated bedding;
...iece 6", most 1-2", essen-
...tial; fair core; Chemung fm.,
... and slst)

...tone; silty texture; un-
...y; hard; laminated bedding;
...piece 8", most 2-4" below 31',
...1', essentially horizontal;
...31', then good; Chemung fm.,
... and slst)

... 26.0', caved @ 27.0,(9/7/71)
...5.3', 100% rec. 0% RQD
...11.3', 95% rec. 0% RQD
...19.2', 100% rec. 8% RQD
...27.0', 100% rec. 7% RQD
...37.0', 100% rec. 34% RQD

..., 8/31-9/1/71, DBC, 1169.8

... & clayey, gravelly; well graded
...pel, 40% sand, 40% fines; slight-
...brown; dry; slight permeability;
...geneous; glacial till; (SC-SM)

...ered shale; brown; moist; al-
...ike; Chemung fm., Devonian;(sh)

...iltstone; silty texture; mo-
...athered; gray; hard; laminated
...rgest core piece 5", most 1-2";
... horizontal; mostly very poor
...good from 11.5-14.0', 17.0-
...ung fm., Devonian; (sh and slst)

...iltstone; silty texture; mostly
...t gray; hard; laminated bedding;
...e piece 5", mostly 1-3"; essen
...ential; good core; Chemung fm.,
...sh and slst)

...iltstone; silty texture; un-
... gray; hard; laminated bedding;
...e piece 5", most 1-3"; essen-
...tial; good core; Chemung fm.,
...(sh and slst)

... @ 5.5', caved @ 6.5', (9/7/71)
...9-19.0', 100% rec, 18% RQD
...9-29.0', 100% rec, 14% RQD
...9-31.0', 100% rec, 38% RQD
...ues tabulated in narrative.

DH760, Right Emergency Spillwy, 9/1-9/2/71, DBC, 1160.6

62 116 BH		Sand, silty & clayey, gravelly; well graded; est. 20% gravel, 35% sand, 40% fines; slightly plastic; brown; dry; slight permeability; dense; homogeneous; glacial till; (SC SM)
	5.8	
96 59/.2 BH		Highly weathered shale; brown; moist; almost soil like; Chemung fm., Devonian; (sh)
	7.7	
NX 92% rec. 0% RQD		Shale and siltstone; silty texture; moderately weathered, then unweathered; brown to gray; moderately hard to hard; laminated bedding; fracture spacing <1"; essentially horizontal; poor core; Chemung fm., Devonian; (sh and slst)
	13.0	
NX 100% rec. 0% RQD		Shale and siltstone; silty texture; moderately weathered; brown to gray; moderately hard to hard; laminated bedding; fracture spacing <1"; essentially horizontal; poor core; Chemung fm., Devonian; (sh and slst)
	20.8	
NX 100% rec. 0% RQD		Shale and siltstone; silty texture; moderately weathered to 22.0', then unweathered; gray; hard; laminated bedding; longest core piece 3", most <1"; essentially horizontal; poor core; Chemung fm., Devonian; (sh and slst)
	23.0	
	EOH	
	NOTE:	No water observed, caved @ 6.0',(9/7/71). Run 1, 7.7-13.0', 92% rec, 0% RQD 2, 13.0-20.8', 100% rec, 0% RQD 3, 20.8-23.0', 100% rec, 0% RQD

DH351, Principal Spillwy, 8/30/71, DBC, 1103.7

	0.6	Topsoil, brown, dry
16 24 100/.5 BH		Gravel, sandy, silty; poorly graded; est. 60% gravel, 25% sand, 15% fines; slightly plastic; gray brown; dry to 6', then wet; moderate permeability; medium density, N=16-24', poorly stratified; alluvial; (GM)
	5.2	
NX 96% rec. 0% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; longest core piece 3", most 3/4"-3"; essentially horizontal; fair to good core; Chemung fm., Devonian; (sh and slst)
	15.2	
	EOH	
	NOTE:	Water level 4.0', caved 5.2', (9/2/71). Run 1, 5.2-15.2', 96% rec, 0% RQD

DH352, Principal Spillway, 8/26/71, DBC, 1101.9

27 42 28		Gravel, sandy, silty; poorly graded; est. 65% gravel, 25% sand, 10% fines; slightly plastic; brown to gray; dry to wet @ 4.3'; moderate to rapid permeability; medium to dense, N=27-42; poorly stratified; alluvial; (GM-GP)
	6.7	
39 68 129/.9 BH		Silt and clay, w/sand and gravel; poorly graded; est. 15% gravel, 15% sand, 70% fines; slightly plastic; gray; moist; impermeable; hard, N=39-68; homogeneous; glacial till; (CL-ML)
	12.0	

DH352 (con't)

NX 100% rec. 7% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; longest core piece 4", most 1-2"; essentially horizontal; good core; Chemung fm., Devonian; (sh and slst)
	22.0	
	EOH	
	NOTE:	Water level @ 6.0', caved @ 6.6', (9/2/71) Run 1, 12.0-22.0', 100% rec, 7% RQD

DH353, Principal Spillway 8/26/71, DBC, 1101.6

19 37 13 29		Gravel, sandy, silty; poorly graded; est. 65% gravel, 25% sand, 10% fines; slightly plastic; brown to gray; dry to wet @ 4.2'; moderate to rapid permeability; medium to dense, N=13-37'; poorly stratified; alluvial (GM-GP)
	7.6	
27 22 18 20 54 59 52		Silt and clay, sandy, gravelly; poorly graded; est. 15% gravel, 15% sand, 70% fines; slightly plastic; gray; moist; impermeable; very stiff to hard, N=18-59; homogeneous; glacial till; (CL-ML)
	21.6	
BH		Highly weathered bedrock; brown; moist; almost till like; Chemung fm., Devonian; (sh).
	22.0	
NX 100% rec. 15% RQD		Shale and siltstone; silty texture; unweathered; gray; hard; laminated bedding; longest core piece 5", most 1-2"; essentially horizontal; good core; Chemung fm., Devonian; (sh and slst)
	27.0	
	EOH	
	NOTE:	Water level @ 5.2', caved @ 10.1', (9/2/71). Run 1, 22.0-27.0', 100% rec, 15% RQD

DH354, Principal Spillway, 8/27-8/30/71, DBC, 1109.0

	0.3	Topsoil, brown, dry
79 63 25		Gravel, sandy, silty; poorly graded; est. 50% gravel, 25% sand, 25% fines; slightly plastic; brown to gray; dry to wet @ 4.2'; moderate permeability; medium to very dense, N=25-79; poorly stratified; alluvial; (GM-GP)
	5.7	
100/.4 BH 80 31 47 100/.3 BH 64 80 80 76 127/.9		Silt and clay, w/sand and gravel; poorly graded; est. 15% gravel, 15% sand, 70% fines; slightly plastic; gray; moist; impermeable; hard, N=31-80; homogeneous; glacial till; (CL-ML)
	26.8	

AS BUILT

NEWTOWN-HOFFMAN CREEKS
WATERSHED PROJECT
MULTIPLE PURPOSE DAM SITE 18
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged [illegible] Date [illegible]
Title GEOLOGIST
Traced [illegible]
Checked [illegible]

Approved Richard L. Phillips
Title STATE CONS. ENGINEER

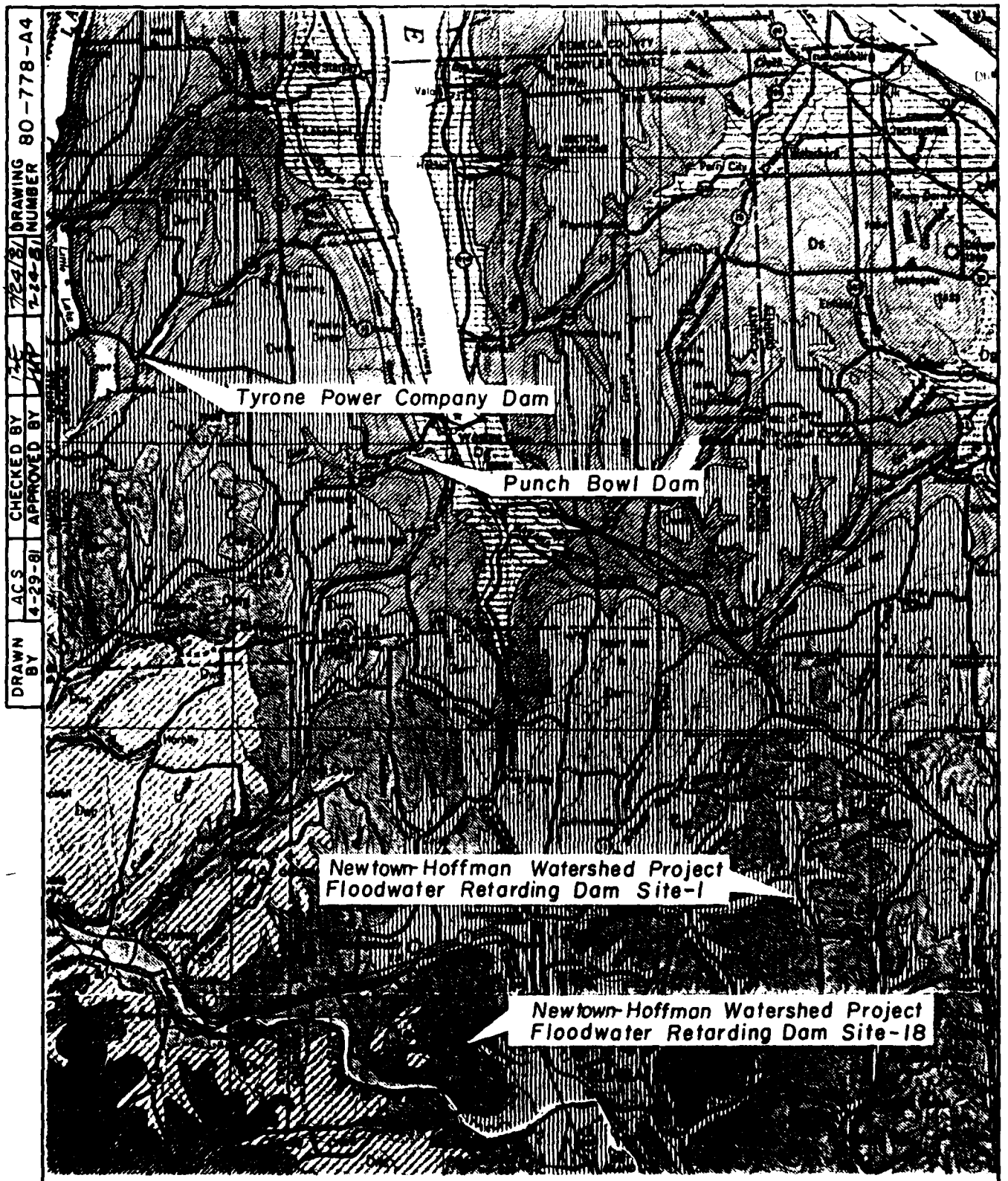
Scale
Drawing No. NY-2289-P
Sheet No. 34 35

PLATE 8

DAPPOLONIA

APPENDIX F

GEOLOGY MAP



GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED 1970, SCALE 1:250,000

D'APPOLONIA

DRAWN BY	AGS	CHECKED BY	JE	3/7/81	DRAWING NUMBER 80-778-A6
	4-29-81	APPROVED BY	~ HD	S-7-81	

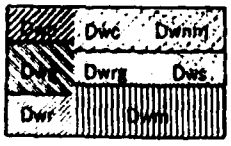
LEGEND

CANADAWAY GROUP
800-1200 ft. (240-370 m.)

Dcy — Machias Formation—shale, siltstone; Rushford Sandstone; Caneadea, Canisteo, and Hume Shales, Canaseraga Sandstone; South Wales and Dunkirk Shales; in Pennsylvania- Towanda Formation--shale, sandstone.

JAVA GROUP
300-700 ft. (90-210 m.)

Dj — Wiscoy Formation--sandstone, shale- Hanover and Pipe Creek Shales.



WEST FALLS GROUP
1100-1600 ft. (340-490 m.)

Dwn — Nunda Formation—sandstone, shale.

Dwg — West Hill and Gardeau Formations—shale, siltstone; Roricks Glen Shale, upper Beers Hill Shale; Grimes Siltstone.

Dwr — lower Beers Hill Shale; Dunn Hill, Millport, and Moreland Shales.

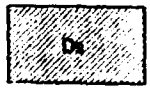
Dwc — Nunda Formation—sandstone, shale; West Hill Formation—shale, siltstone; Corning Shale

Dwnm — "New Milford" Formation—sandstone, shale

Dwg — Gardeau Formation—shale,, siltstone; Roricks Glen Shale.

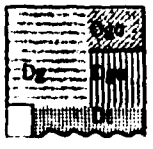
Dws — Slide Mountain Formation—sandstone, shale, conglomerate.

Dwm — Beers Hill Shale; Grimes Siltstone; Dunn Hill, Millport, and Moreland Shales



SONYEA GROUP
200-1000 ft. (60-300 m.)

Ds — In west: Cashaqua and Middlesex Shales.
In east- Rye Point Shale, Rock Stream ("Enfield") Siltstone; Pulteney, Sawmill Creek, Johns Creek, and Montour Shales.



GENESEE GROUP AND TULLY LIMESTONE
200-1000 ft. (60-300 m.)

Dg — West River Shale; Genundewa Limestone; Penn Yan and Geneseo Shales; all except Geneseo replaced eastwardly by Ithaca Formation—shale, siltstone and Sherburne Siltstone.

Dgo — Oneonta Formation—shale, sandstone.

Dgw — Unadilla Formation—shale siltstone

Dt — Tully Limestone.

LOCKPORT GROUP
80-175 ft. (25-55 m.)

Sl — Oak Orchard and Penfield Dolostones, both replaced eastwardly by Sconondoa Formation—limestone, dolostone.

GEOLOGY MAP LEGEND

REFERENCE
GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED 1970, SCALE 1:250,000

D'APPOLONIA

10 1293 HERCULENE A&B SMITH CO PGH PA LT1830-1078

APPENDIX G

STABILITY ANALYSES

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE - Soil Mechanics Laboratory

800 "J" Street, Lincoln, Nebraska 685(

3/24/72
3/15/72

SUBJECT: ENG 22-5, New York WF-08, Newtown-Hoffman Site No. 18 (Chemung County)

DATE: March 13, 1972

TO: Richard L. Phillips, State Conservation Engineer
SCS, Syracuse, New York

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-128, Consolidation Test, 1 sheet.
3. Form SCS-127, Soil Permeability, 1 sheet.
4. Form SCS-355A & B, Triaxial Shear Test Data, 2 tests, 4 sheets.
5. Form SCS-352, Compaction and Penetration Resistance, 2 sheets.
6. Form SCS-353, Soil Classification, 1 sheet.
7. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.
8. Form RTSC-FW-ENG-42, Determination of s and Probable Joint Gaps, 1 sheet.

INTRODUCTION

The proposed 71-foot high, Class "C" hazard dam is located in the Allegheny Plateau physiographic area of south central New York.

The major engineering problems appear to be controlling seepage from the high water tables in the abutments, under the dam, and through possible differential settlement cracks at the base of the right abutment.

DISCUSSION

FOUNDATION

A. Classification. Two to 6 feet of alluvial gravel overlie the glacial till in the left half of the flood plain and the shale bedrock in the right side of the flood plain.

The right abutment consists of shale and siltstone of the Chemung formation with 0 to 8 feet of silty sand blanketing the upper slopes. The surface of the bedrock is weathered to depths up to 6 feet.

The left abutment consists of glacial till to the depths investigated (up to 52'). The upper portion in the surface 6 to 18 feet is SM and SC-SM, and the underlying till is CL-ML.

B. Dry Unit Weight. Standard penetration tests yielded blow counts of 10 to 57 blows per foot in the gravelly alluvium and the glacial till in the flood plain. Most of the blow counts were in the range of 20 to 30 blows per foot.

Blow counts in the glacial till in the left abutment were generally greater than those in the till underlying the flood plain.

C. Shear Strength. The high-blow-count gravelly flood plain alluvium is expected to have minimum shear parameters of ϕ = 35° and c = 0 psf. The underlying dense till is expected to be as strong or stronger than the gravelly alluvium.

D. Permeability. Low to moderate artesian pressures were reported in the emergency spillway test holes. Field permeability tests in the bedrock of the right abutment gave permeability rates up to 5 fpd.

The gradation of the alluvial material "A" with a D_{20} size of 0.6 to 0.8 mm indicates permeability rates of 300 to 600 fpd.

EMBANKMENT

A. Classification. Most of the embankment material will consist of gravelly glacial till from the borrow area and emergency spillway excavations. The 2 samples submitted to the SML were GC materials with 28% and 30% gravel, 25% and 24% sand, and 47% and 46% fines. Liquid limits of the 2 samples were 25 and 27 and the plasticity indices were 8 and 10.

The deeper glacial till in the emergency spillway excavation is finer textured than the above GC samples. Sample 504.1 was classified as CL-ML in the New York laboratory.

Some shale and siltstone will be available from the right emergency spillway excavation.

B. Compacted Dry Density. Standard Proctor compaction tests (ASTM D-698, Method A) were made on the minus No. 4 fraction of the 2 gravelly borrow samples. Maximum dry densities of 125.0 pcf and 125.5 pcf were obtained from the tests. Optimum moisture contents were 11% for both tests.

C. Shear Strength. Consolidated undrained triaxial shear tests were made on the minus No. 4 fractions of both of the GC samples. The 1.4-inch diameter shear specimens were molded to 98% of Standard density at moisture contents approximately 2% wet of optimum. The test specimens were back pressured in the shear machines from 83 to 107 psi to obtain full saturation. Pore pressures were measured, and effective stress parameters were determined. The shear test data was interpreted to give the following values:

Sample Number		Dry Density pcf	% of Standard	Shear Parameters			
				Total Stress		Effect. Stress	
Field	Laboratory			ϕ deg.	c psf	ϕ deg.	c psf
213.1	72W1287	122.2	98	13	1325	28.5	575
Composite	72W1288	122.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

D. Consolidation. A one-dimensional consolidation test was made on the minus No. 4 fraction at 98% of Standard density (122.0 pcf). The 2.5-inch diameter test specimen was molded slightly wet of optimum and then saturated at the start of the loading in the consolidation test. The test specimen was loaded to 16,000 psf. Under the 10,000 psf load for the base of the proposed 71-foot high embankment the test specimen consolidated approximately 2%. The average embankment settlement across the flood plain is estimated to be approximately 1%.

E. Permeability. A falling head permeability test on the consolidation test specimen shows an initial permeability rate of approximately 0.0025 ft/day.

STABILITY ANALYSIS

The stability of the proposed 71-foot high, Class "C" hazard embankment was analyzed using a modified Swedish circle method (Fellenius) and a sliding block analysis.

Total stress shear parameters of $\phi = 16°$ and $c = 850$ psf for the compacted embankment materials gave the lowest safety factors in the embankment-only analysis of the maximum section. The full drawdown analysis of the 3:1 upstream slope gave a safety factor of 1.57 (trial No. 4). The steady seepage analysis of the $2\frac{1}{2}$:1 downstream slope with a drain at c/b = 0.6 shows a minimum safety factor of 1.56 (trial No. 2).

A sliding block analysis of the $2\frac{1}{2}$:1 downstream slope, using shear parameters of $\phi = 35°$ and $c = 0$ psf for the flood plain alluvium, gave a higher safety factor than the embankment-only Swedish circle analysis.

CONCLUSIONS AND RECOMMENDATIONS

A. Site Preparation and Centerline Cutoff. Actual test values for the consolidation potential of the foundation alluvium and glacial till are not available. Past experience indicates SM material with blow counts of 10 to 30 blows per foot can be expected to have consolidation potentials of 2% to 5% under the 10,000 psf load of the proposed 71-foot high embankment. Settlement calculations were made assuming an average foundation consolidation of 3% for the upper 20 feet of the flood plain. Compressibility of the material below 20 feet was considered negligible.

Assuming a 3% consolidation potential in the alluvium and till at the base of the steep right abutment and zero compressibility in the shale bedrock abutment, a differential settlement of 0.03 ft/ft was calculated for the 1:1 slope of the lower abutment. The low-plasticity embankment materials overlying the steep lower abutment may crack under this

differential. The differential settlement can be reduced by replacing the questionable alluvium (with an assumed 3% consolidation) with compacted till with a known consolidation potential (2% according to the test data). It may also be possible to spread the differential settlements over a wider area by backsloping the abutments in the steep lower portions. An additional protective measure would be to provide an embankment zone over the lower abutment of broadly graded sand and gravel that would be highly resistant to a concentrated leak. The GP-GC alluvium (Material A) with cobbles up to 6 inches and a D_{85} size of approximately 2 inches would bridge most cracks that appear likely to occur. The broadly graded gravel is a Class I material for resisting concentrated leaks according to Sherard's classification in his article "Earthquake Considerations in Earth Dam Design," Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineering, Vol. 93, No. SM4, July 1967.

It is suggested the lower right abutment be backsloped as far as possible with ordinary earth-moving equipment and that the glacial till in the lower left abutment be backsloped to a 3:1 or flatter slope.

A 25 to 40-foot wide cutoff trench through the gravelly alluvium is suggested based on the w = h - d relationship as given in the Bureau of Reclamation's "Design of Small Dams," p 168, to reduce the seepage under the dam. Side slopes of the cutoff trench of 1:1 or flatter are adequate. Backfill the cutoff trench with the gravelly till (Material B) and compact to a minimum density of 98% of Standard (ASTM D-698, Method A).

B. Principal Spillway. The sloping bedrock surface under the principal spillway at the proposed location presents a condition that is quite difficult to analyze, and we do not have accurate foundation consolidation information. A simplified situation with a level bedrock surface and 20 feet of compressible foundation material with a 3% consolidation potential was assumed for estimating purposes. The assumed situation was analyzed using the method of Technical Release No. 19 (Rev.). The analysis (see attached Form RTSC-FW-ENG-42) shows a horizontal strain of approximately 0.002 ft/ft. The sloping bedrock situation at the site with 5 feet of compressible material in the upstream portion and 25 feet in the downstream portion is expected to be less severe than the simplified condition that was analyzed.

A ϕ angle of 28° is suggested for conduit loading calculations.

C. Drainage. A foundation trench drain at c/t = 0.6 is recommended across the flood plain and in the left abutment below permanent pool elevation to control seepage that bypasses the centerline cutoff and to safely outlet seepage from the high water tables in the abutments. A blanket drain is recommended below the permanent pool elevation on the shale bedrock of the lower right abutment from c/b = 0.6 to c/b = 0.8. A

coarse-grained filter material such as ASTM D-448 - No. 78 or No. 68 will be adequate to drain the alluvial gravels and the gravelly till.

D. Embankment Design. The following are recommended:

1. Place the gravelly GC glacial tills in the center and downstream sections at a minimum density of 98% of Standard (ASTM D-698, Method A or Method C).

2. Provide an embankment zone of the on-site gravelly alluvium (Material A) over the foundation drain and adjacent to the lower right abutment to provide high resistance to concentrated leaks that could develop due to differential settlement. Extending the GP-GM gravel zone all the way across the flood plain will provide a higher level of protection from piping in the entire lower portion of the dam. A massive section (10 feet) will serve as a filter for the gravelly till (Material B) and also be a self-healing material by forming its own filter in a crack.

3. Place the silty till (Material C) in the upstream portion of the embankment at a minimum density of 98% of Standard.

4. Selectively place the shale borrow materials in the upper portion of the downstream section above the phreatic line using a methods specification that gives a firm mass.

5. Provide 3:1 upstream slopes and $2\frac{1}{2}$:1 downstream slopes.

6. Provide an overfill of 1.0 foot to compensate for residual foundation and embankment settlement.

E. Emergency Spillway. Horizontal drains into the abutment at the contact between the "B" and "C" tills and at grade in the outer slope of the emergency spillway excavation should be considered in the left abutment to assure a stable slope, as the materials have a local history of slipping.

Prepared by:

Edgar F. Steele

Reviewed and Approved by:

Lorn P. Dunnigan
Head, Soil Mechanics Laboratory

Attachments

cc:
Bernard S. Ellis, Syracuse, N. Y.
Joseph Pelileah, Binghamton, N. Y.
Neil F. Bogner, Upper Darby, Pa.

9-64

CLASSIFICATION NO. 217.1

MATERIALS TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	SOIL CLASSIFICATION

PROJECT OR STATE: Newtown-Hoffman; 13,..New York

SAMPLE LOCATION: Left Emergency Spillway

FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN
217.1	14-15'	Alluvial

TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
Dist.	Syracuse, New York		9/71

SYMBOL: GC-GM-GP

DESCRIPTION: Brown, 9% +1"

MAT'L "A" "B" "C"

GRAIN SIZE DISTRIBUTION

C_u 6.5 | C_c 278 | D_{MAX} 75. | D_{85} 43. | D_{60} 7.8 | D_{50} 4.2 | D_{30} 1.2 | D_{10} .26 | D_5 .028

GRAVELS | SANDS | FINES

SIEVE OPENING (mm)

US STANDARD SIEVE SIZE

GRAIN SIZE IN MILLIMETERS

PERCENT FINER BY DRY WEIGHT

UNDISTURBED CONDITION: MOISTURE %; DRY UNIT WEIGHT pcf

SOLUBLE SALTS %

SHRINKAGE LIMIT %

ATTERBERG LIMITS: NATURAL MOISTURE; AIR DRY; OVEN DRY; LL; PI

SPECIFIC GRAVITY (G_s)

REMARKS

(5)

Form SCS 378
9-64

LABORATORY NO [illegible]

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	CONSOLIDATION TEST

PROJECT and STATE [illegible]

SAMPLE LOCATION [illegible]

FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN
[illegible]	[illegible]	Glacial Till

TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
[illegible]	[illegible]	Edgar F. Steele	3/1/72

CLASSIFICATION [illegible]

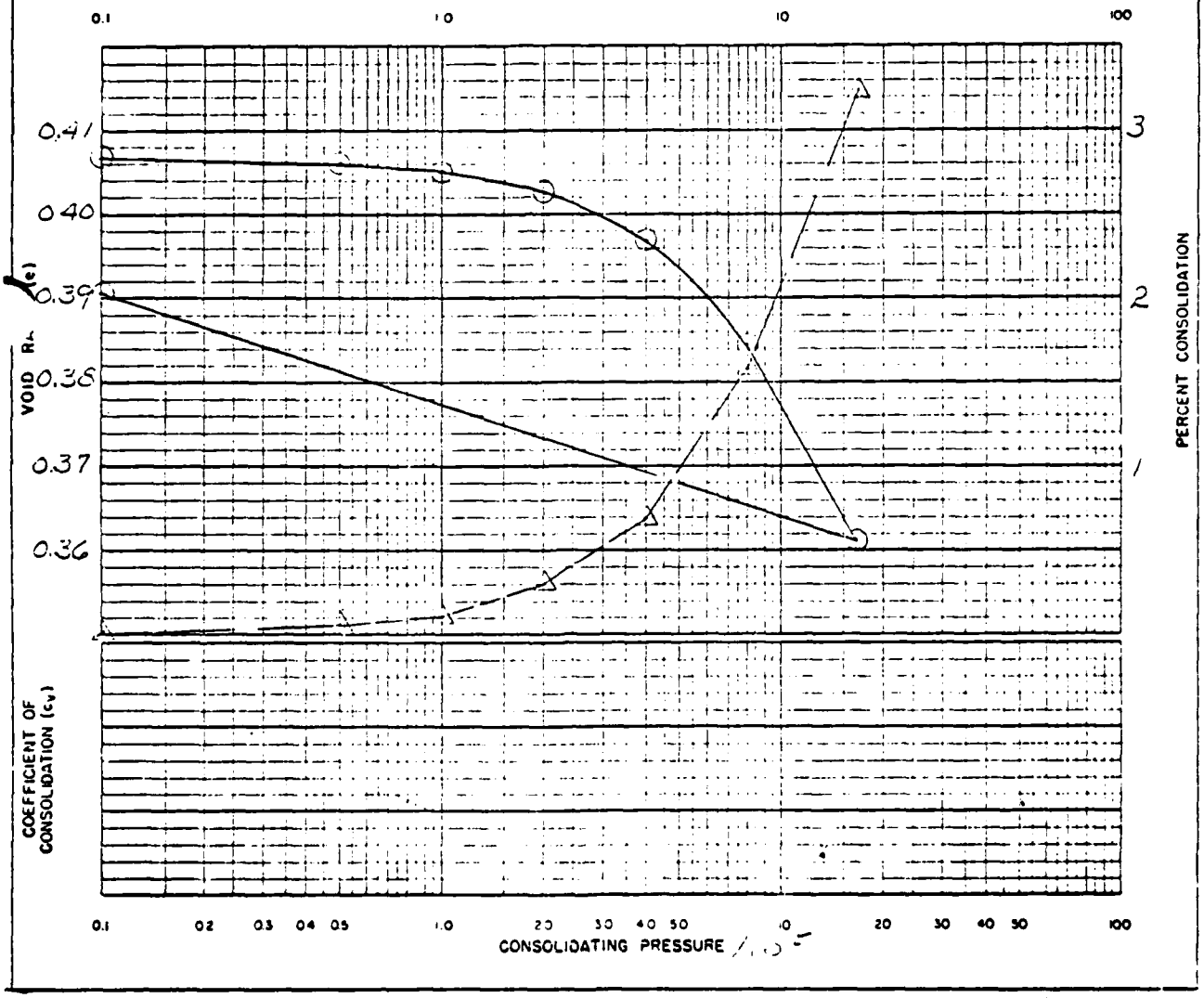
G_s [illegible] LL [illegible] PI 8

INITIAL DENSITY γ_d [illegible]

INITIAL VOID RATIO, e_o [illegible]

COMPRESSION INDEX, C_c [illegible]

TEST SPECIFICATIONS:
Saturated at Start



MATERIALS TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	SOIL PERMEABILITY

PROJECT and STATE: [illegible] NEW YORK

SAMPLE LOCATION: [illegible]

FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN
[illegible]	[illegible]	GLACIAL TILL

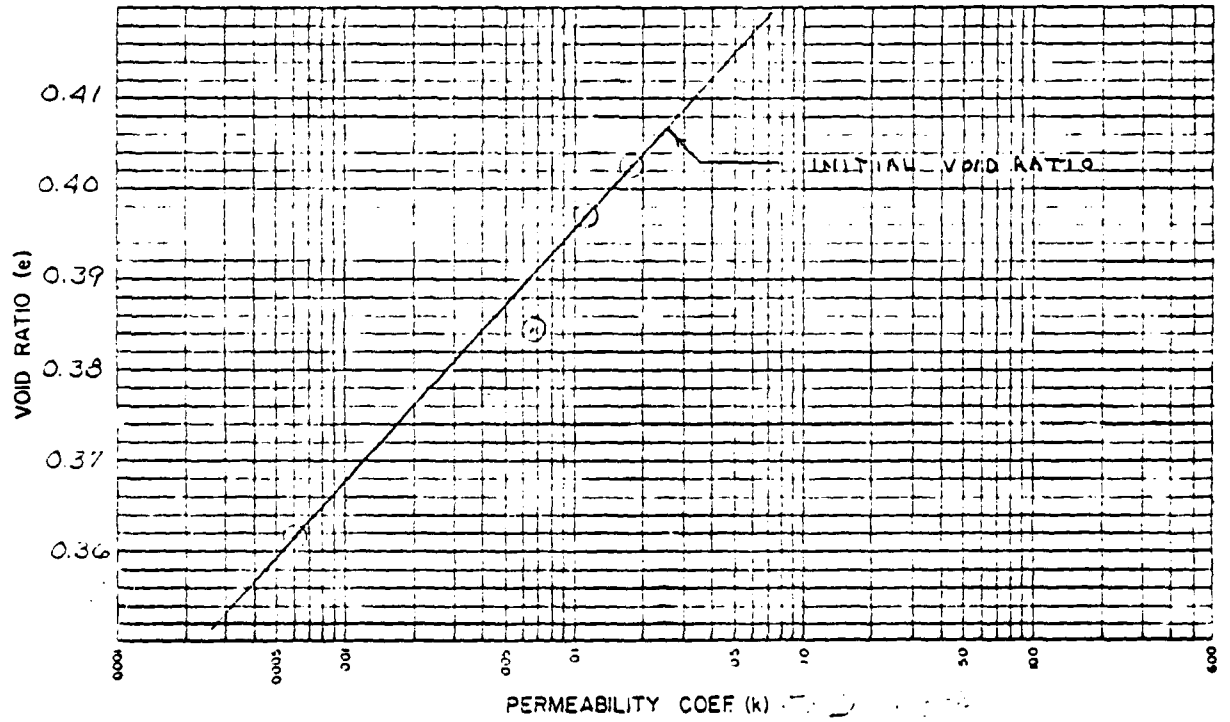
TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
[illegible]	SYRACUSE, N.Y.	Edgar E. Steele	3/2/72

CLASSIFICATION GC LL 28 PI 5

SPECIFIC GRAVITY

TEST NO	[illegible]	[illegible]	[illegible]	[illegible]	G_s (-) #4	2.72
INITIAL MOISTURE %					G_s (+) #4	
DRY DENSITY ☑ g/cc ☐ pcf	[illegible]	[illegible]	[illegible]	[illegible]	G_m(Bulk)(+) #4	
VOID RATIO	[illegible]	[illegible]	[illegible]	[illegible]		
PERMEABILITY COEF	[illegible]	[illegible]	[illegible]	[illegible]		
PERCOLATION COEF						
H/L DURING TEST						

TEST SPECIFICATIONS
Falling Head Perm Test on The Consolidation Sample



REMARKS

K @ initial density = 0.0025 ft/day

Form SCS 559a
Rev 6-65

LABORATORY NO 72W1297

MATERIALS TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST

PROJECT and STATE: MONTANA - BOZEMAN SITE 18 NEW YORK
SAMPLE LOCATION: ENDER. JAMY. MATERIAL "B"
FIELD SAMPLE NO: 213.1
DEPTH: 5-10'
GEOLOGIC ORIGIN: Glacial Till
TYPE OF SAMPLE: COMPACTED
TESTED AT: SML-LINCOLN
APPROVED BY: Edgar F Steele
DATE: 3/1/72

INDEX TEST DATA

USCS GC ; LL 25 , PI 8
% FINER (mm): 0.002 9 ; 0.005 15 ;
0.074 (#200) 47
G_s (-#4) 2.75 ; G_s (+#4) _____
STANDARD: γ_d MAX. 125.0 pcf; w_o 11.0 %
MODIFIED: γ_d MAX. _____ pcf; w_o _____ %

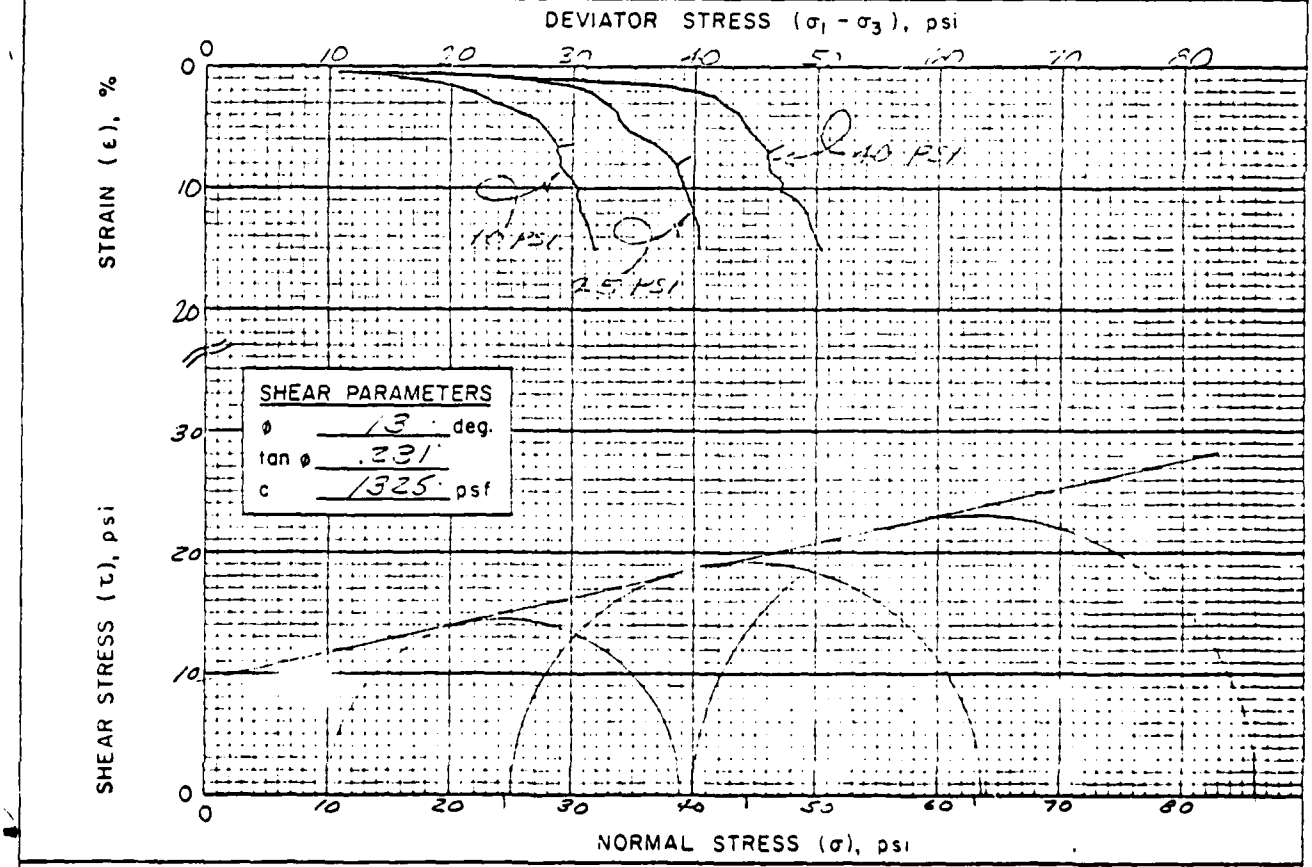
SPECIMEN DATA

HEIGHT 3.0 "; DIAMETER 1.4 "
MATERIALS TESTED PASSED ~~#4~~ SIEVE
METHOD OF PREPARATION STATIC
2 LAYER COMPACTION
MOLDING MOISTURE 12.7 %
MOLDED AT 97.8 % OF γ_d MAXIMUM

TYPE OF TEST

UU ☐
CU ☐
$\overline{CU}$ ☑
CD ☐

DRY DENSITY INITIAL pcf ☒ g/cc ☐	DRY DENSITY CONSOLIDATED pcf ☐ g/cc ☐	B, Parameter	MOISTURE CONTENT, % START OF TEST	MOISTURE CONTENT, % DEG. OF SAT. AT START OF TEST	MOISTURE CONTENT, % END OF TEST	TIME OF CONSOLIDATION (hrs.)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ε (%)
122.2		0.96			14.1	63.83	10	28.8	6.5
122.4		0.96			13.7	16.45	25	38.5	8.1
122.1		0.97			13.6	15.92	40	46.0	7.0



REMARKS BACK-PRESSURED

PAGE G9 OF 17

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LABORATORY NO. 72W1227

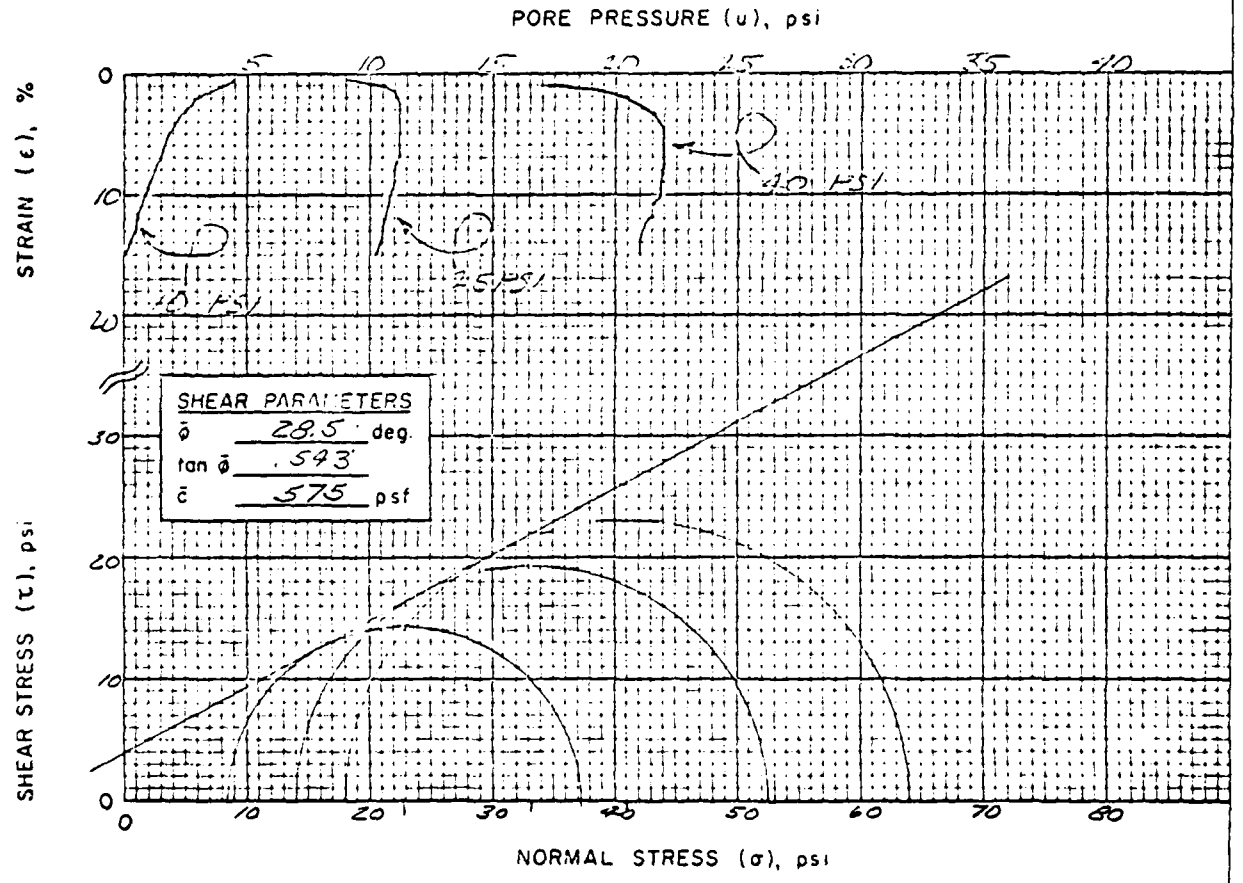
MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST with pore pressure measured

PROJECT and STATE: NEWTOWN - HOFFMAN SITE 18 NEW YORK

SAMPLE LOCATION: FINES. STKPY. MATERIAL "B"

TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
COMPACTED	SML - LINCOLN	[illegible]	3/1/72

MINOR PRINCIPAL STRESS, σ_3 (psi)	PORE PRESSURE, u (psi)	EFFECTIVE MINOR PRINCIPAL STRESS, $\bar{\sigma}_3$ (psi)	DEVIATOR STRESS, $\sigma_1 - \sigma_3$ (psi)	FAILURE CRITERIA	AXIAL STRAIN AT FAILURE, ε (%)
10	1.6	8.4	28.8		6.5
25	11.0	14.0	38.5		8.1
40	22.0	18.0	46.0		7.0



REMARKS BACK-PRESSURED

[illegible]
Y.N.G

Form SCS 355-A
Rev 6-65

LABORATORY NO. 72-NY-12-95

MATERIALS TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST

PROJECT and STATE: [illegible] SITE 13 NEW YORK

SAMPLE LOCATION: ENDIC. SPNY. (LEFT) MATERIAL "C"

FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN
Composite	5-10'	Glacial Till

TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
COMPACTED	SML-LINCOLN	Edgar F Steele	3/1/72

INDEX TEST DATA

USCS GC ; LL 27 ; PI 10

% FINER (mm): 0.002 11 ; 0.005 17 ;
0.074 (#200) 46

G_s (-#4) 2.76 ; G_s (+#4) _____

STANDARD: γ_d MAX. 125.5 pcf; w_o 11.0 %

MODIFIED: γ_d MAX. _____ pcf; w_o _____ %

SPECIMEN DATA

HEIGHT 3.0 "; DIAMETER 1.4 "

MATERIALS TESTED PASSED #4 SIEVE

METHOD OF PREPARATION STATIC 2 LAYER COMPACTION

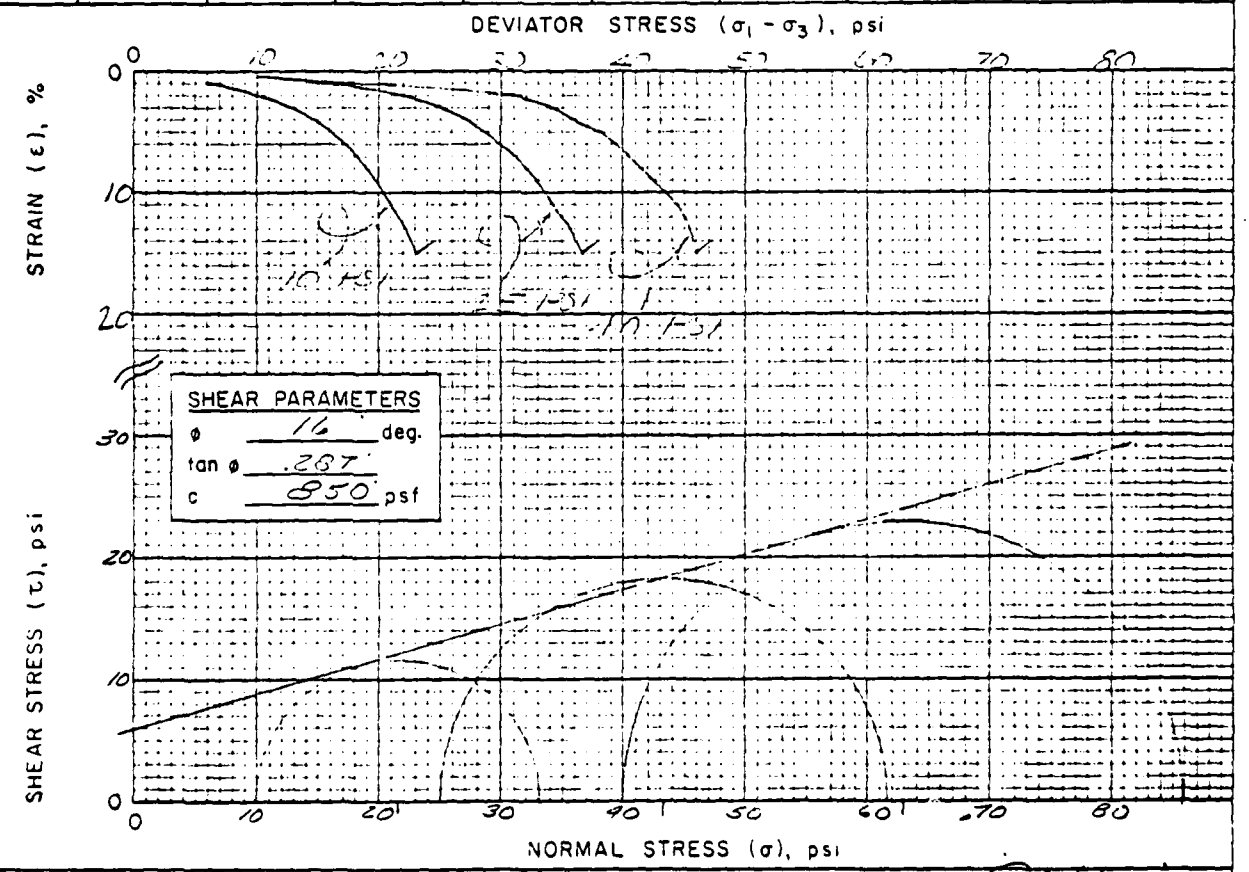
MOLDING MOISTURE 13.3 %

MOLDED AT 97.4% OF γ_d MAXIMUM

TYPE OF TEST

UU ☐
CU ☐
$\overline{CU}$ ☑
CD ☐

DRY DENSITY		B.	MOISTURE CONTENT, %			TIME OF CONSOLI-	MINOR PRINCIPAL	DEVIATOR STRESS	AXIAL STRAIN AT
INITIAL pcf ☒ g/cc ☐	CONSOLI-DATED pcf ☐ g/cc ☐	Parameter	START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST	DATION (hrs.)	STRESS σ_3 (psi)	$\sigma_1 - \sigma_3$ (psi)	FAILURE, ε (%)
122.3		0.95			13.6	15.72	10	23.1	15.0
121.6		0.96			13.2	16.00	25	36.6	15.0
122.6		0.96			12.5	16.00	40	45.9	15.0



REMARKS BACK-PRESSURED

GHH 4.11.5

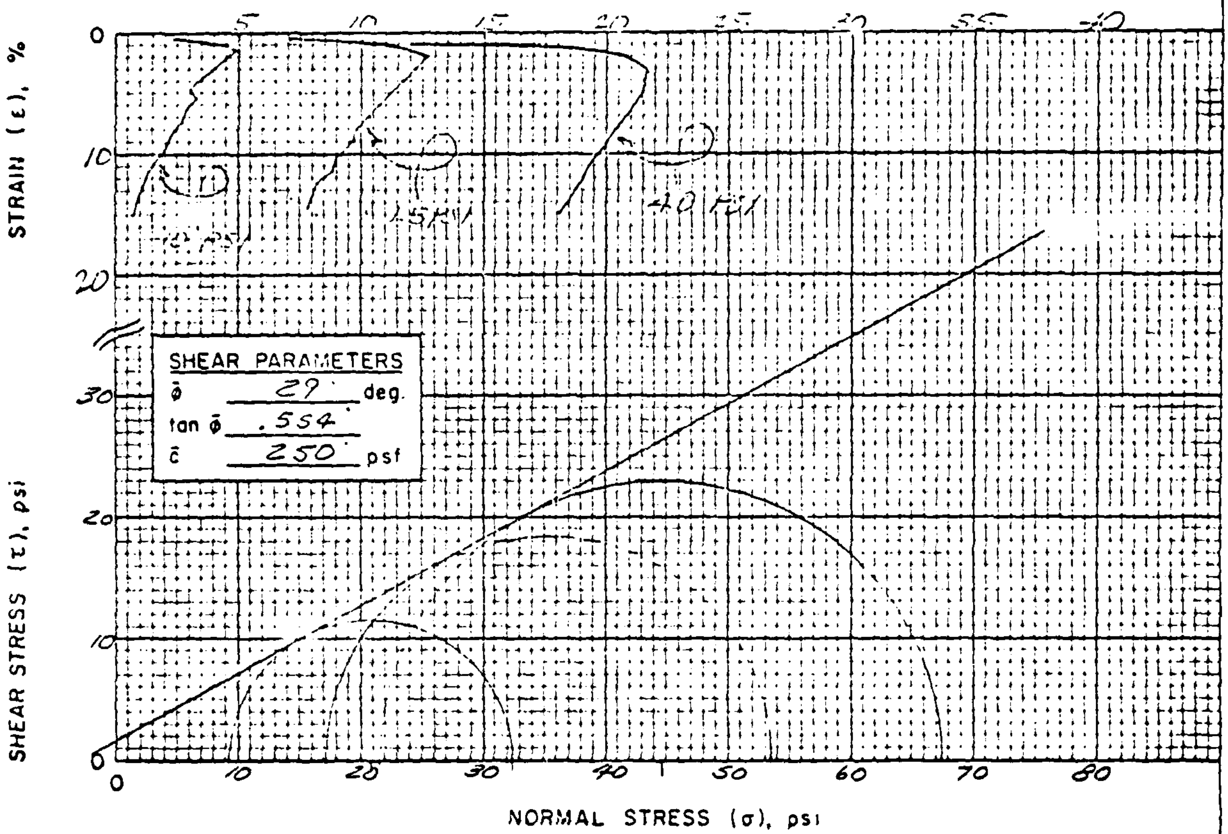
SCS-ENG-353 (6-71)
FILE CODE ENG-22

LABORATORY NO. 72W-1238

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST with pore pressure measured

PROJECT and STATE			SAMPLE LOCATION
[illegible] SITE 18 NEW YORK			EMERG. SPWY. (LEFT) MATERIAL "C"
TYPE OF SAMPLE	TESTED AT	APPROVED BY	DATE
COMPACTED	SML-LINCOLN, NE	[illegible]	3/1/72

MINOR PRINCIPAL STRESS, σ_3 (psi)	PORE PRESSURE, u (psi)	EFFECTIVE MINOR PRINCIPAL STRESS, $\bar{\sigma}_3$ (psi)	DEVIATOR STRESS, $\sigma_1 - \sigma_3$ (psi)	FAILURE CRITERIA	AXIAL STRAIN AT FAILURE, ε (%)
16	0.7	9.3	23.1		15.0
25	8.2	16.8	36.6		15.0
40	18.1	21.7	45.9		15.0



SHEAR PARAMETERS		
$\bar{\phi}$	29	deg.
tan $\bar{\phi}$	.554	
$\bar{c}$	250	psf

REMARKS BACK-PRESSURED

[illegible]

Rev 5 63

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

PROJECT and STATE: Niagara-Hoffman #18 New York

FIELD SAMPLE NO	LOCATION	DEPTH
213.1	Exper. spwy. (Left) Material "E".	5-10'

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-LINCOLN	EDP	3/1/72

CLASSIFICATION GC LL 25 PI 8

MAX. PARTICLE SIZE INCLUDED IN TEST < #4 "

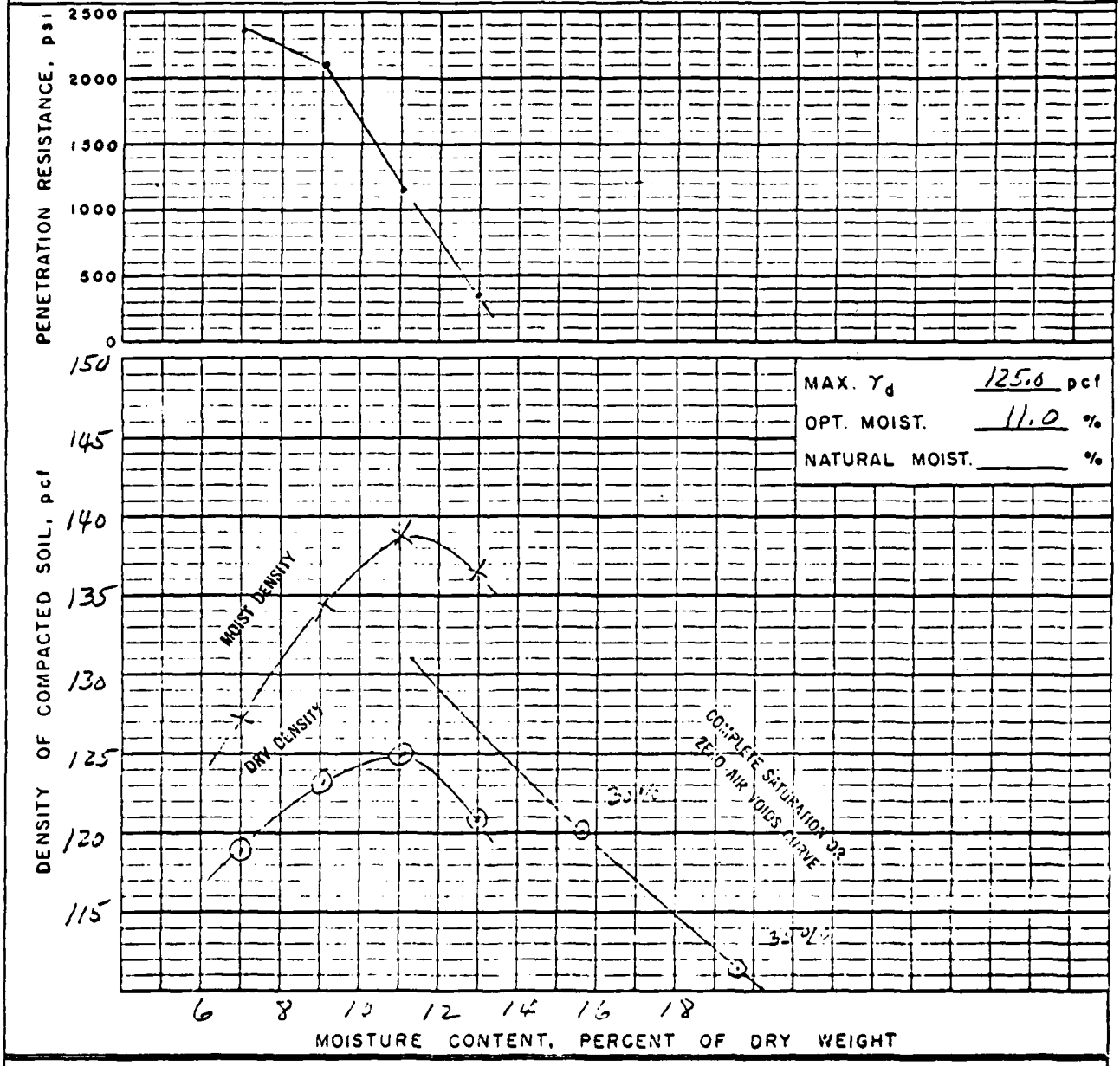
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.75 ; PLUS NO. 4 2.70

CURVE NO. 1 OF 2

STD. (ASTM D-698) ☒; METHOD A

MOD. (ASTM D-1557) ☐; METHOD ____

OTHER TEST ☐ (SEE REMARKS)



REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 47 %; < NO. 4 72 %; < 3 IN. 100 %

Form No. 352
Rev. 5-65

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

PROJECT and STATE: Newtown - Hoffman, New York.

FIELD SAMPLE NO: | LOCATION: Emergency (Left) Material "C" | DEPTH: 10'

GEOLOGIC ORIGIN: | TESTED AT: SML-LINCOLN | APPROVED BY: CTS | DATE: 3/1/72

CLASSIFICATION GC LL 27 PI 10 | CURVE NO. 2 OF 2

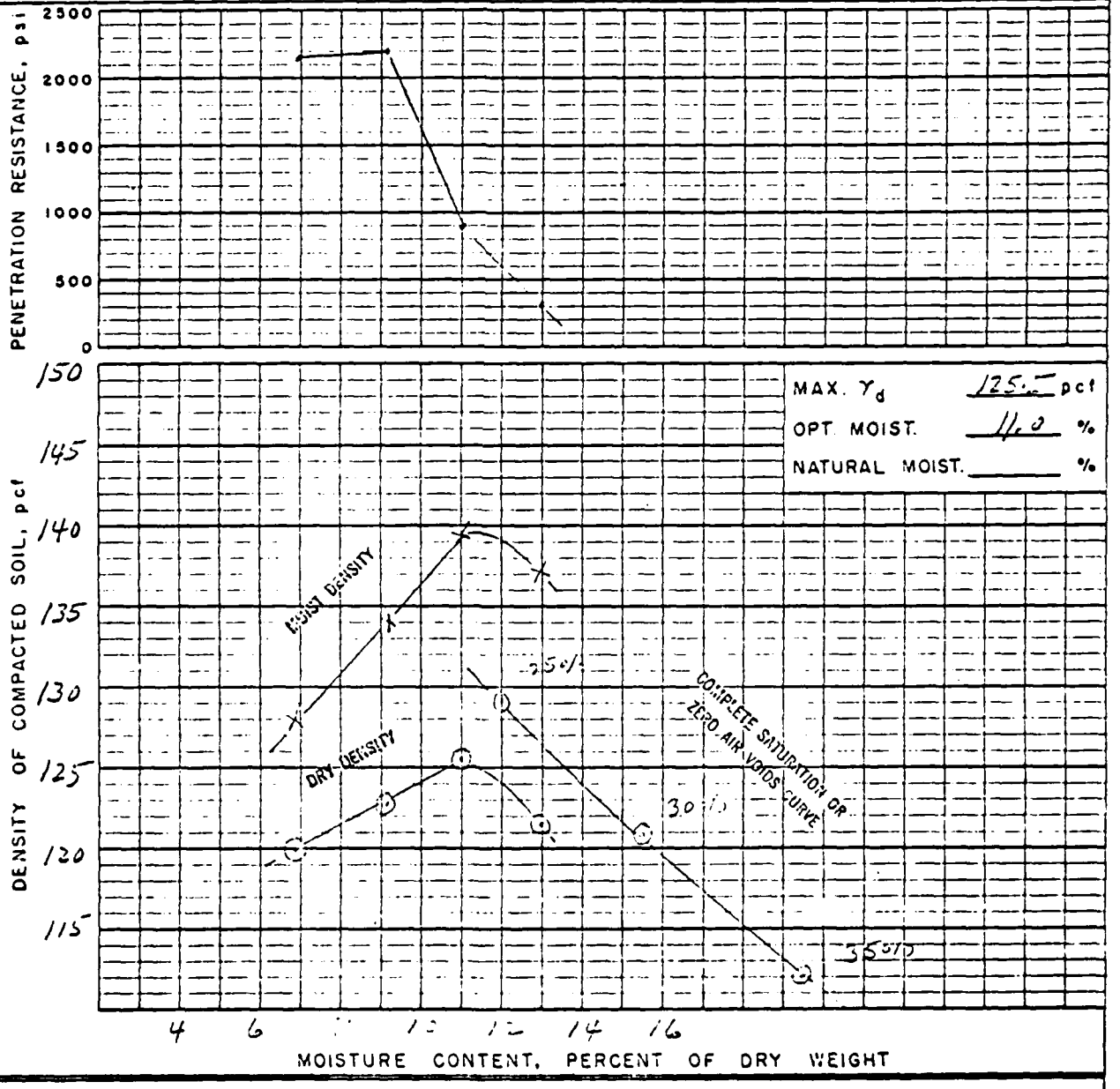
MAX. PARTICLE SIZE INCLUDED IN TEST < #4 "

SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.76 ; PLUS NO. 4 _____ }

STD. (ASTM D-698) ☒; METHOD A

MOD (ASTM D-1557) ☐; METHOD _____

OTHER TEST ☐ (SEE REMARKS)

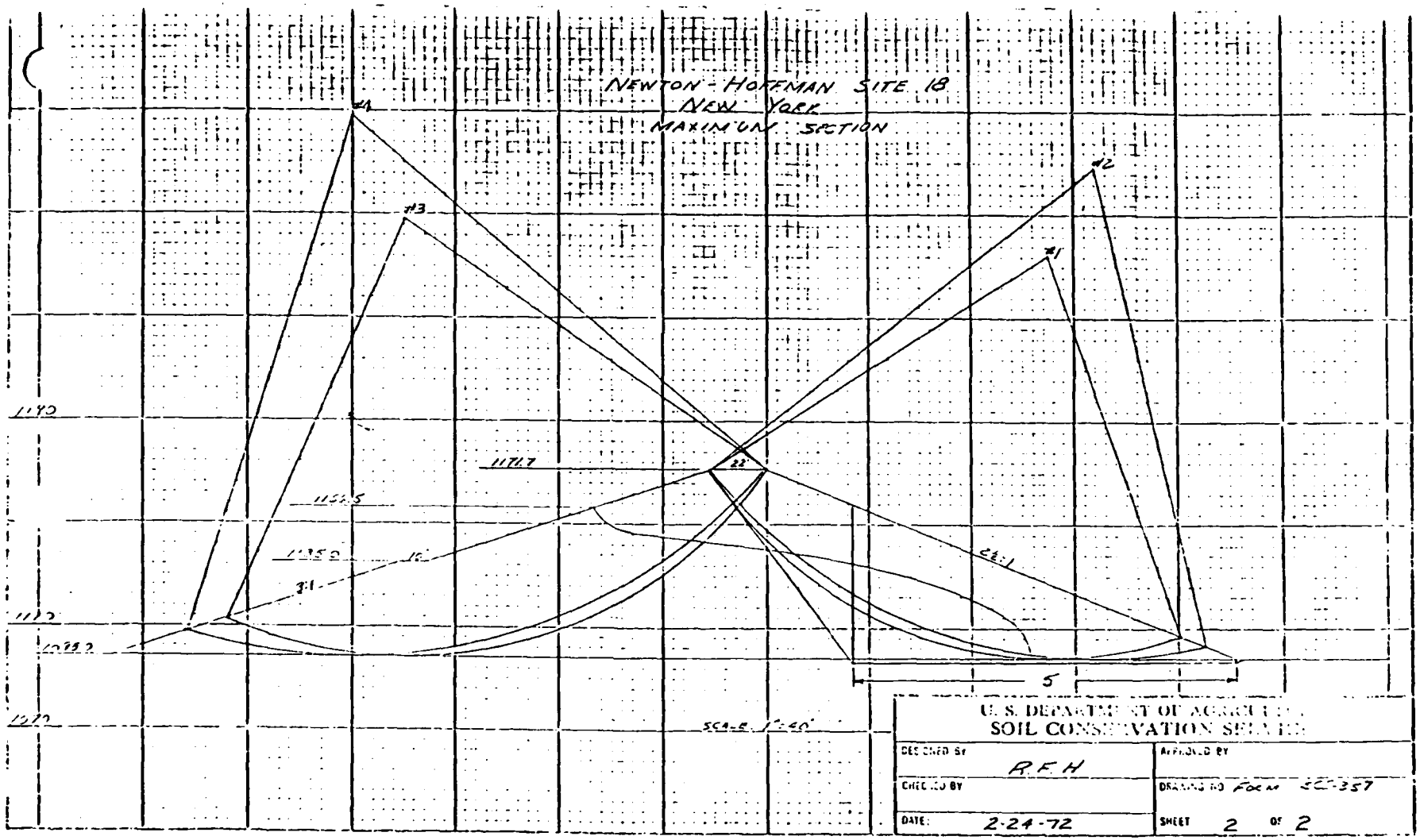


REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 #6 ; < NO. 4 73 ; < 1" IN. 100


NEWTON - HOFFMAN SITE 18
NEW YORK
MAXIMUM SECTION
#1
#2
#3
#1
#2
1142
1137.7
1135.5
1135.0
10'
3:1
2:1
1132
1129.2
1127
5
SCALE 1"=40'
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DESIGNED BY R.F.H
APPROVED BY
CHECKED BY
DRAWING NO FORM SCS-357
DATE: 2-24-72
SHEET 2 OF 2

MATERIALS TESTING REPORT | U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE

SUMMARY - SLOPE STABILITY ANALYSIS

PROJECT and STATE: Alabama - Alabaman | METHOD OF ANALYSIS: Swedish Circle & Sliding Block | ANALYZED AT: S.M.L. | APPROVED BY: Klein Hoyt | DATE: 2-24-72

	SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA: Yd (pcf)	Ym (pcf)	Ysat (pcf)	Ysub (pcf)	ϕ (deg)	tan ϕ	c (psf)	REMARKS
①	EMBANKMENT	GC	130.5	143.0	145.0	82.5	13	.231	1325	CU
②							28.5	.543	575	$\overline{CU}$
③	EMBANKMENT	GC	130.5	143.0	145.0	82.5	16	.287	850	CU
④							29	.554	250	$\overline{CU}$
⑤										
⑥										
⑦										
⑧										

TRIAL NO.	SLOPE	CONDITIONS	F_s
		UPSTREAM - FULL DRAWDOWN — DOWNSTREAM - STEADY SEEPAGE	
		MAXIMUM SECTION	
1	DN	2½:1	DOWN @ C/B = 0.6 EMB (28.5-575)	1.98
1A	DN	2½:1	DOWN @ C/B = 0.6 EMB (13-1325)	1.85
1B	DN	2½:1	DOWN @ C/B = 0.6 EMB (29-250)	1.71
1C	DN	2½:1	DOWN @ C/B = 0.6 EMB (16-850)	1.56
2	DN	2½:1	DOWN @ C/B = 0.6 EMB (16-850)	1.56
3	UP	3:1	10' BERM @ 1135.0 EMB (16-850)	1.58
4	UP	3:1	10' BERM @ 1135.0 FAIL (16-850)	1.57
5	DN	2½:1	STOCK ANALYSIS ON ONE FOOT OF FOUNDATION (35-0)	1.70

Sheet 1 of 2

6-70
(File Code ENG-22)

State: NY	Project: Newton-Harrison	Site: #18	Determination of s and Probable Joint Gaps

Sta. _____ H = 70 ft. d = 20 ft. B = 4.17 ft.

δ = 0.6 ft. ϕ = 35 deg. c = 0 psf

p_c = _____ psf p = H γ_m = 10,000 psf γ_m = 143.0 pcf

Determination of s

$\bar{p} = \frac{H}{2}\gamma_m + y \cdot \gamma_b$ = ( )( ) = 5000
+ ( )( ) = _____

$\bar{p}$ = 5000 psf

Then, $\sigma_3 = 2/3\ \bar{p}$ = 3333 psf

$$\sigma_1 = \frac{2c}{\tan(45° - \phi/2)} + \frac{\sigma_3}{\tan^2(45° - \phi/2)}$$

($\phi/2$ = 17.5; $\tan(45° - \phi/2)$ = .521; $\tan^2(45° - \phi/2)$ = .272)

$$= \frac{2(\quad)}{\tan(\quad)} + \frac{3333}{\tan^2(27.5)} = \quad + 12250 = 12250 \text{ psf}$$

$$s = \frac{\sigma_1 - \sigma_3}{2} = \frac{(12250) - (3333)}{2} = \frac{8917}{2} = 4458 \text{ psf}$$

Joint Gap

B/d = (417)/(20) = 20.8 R_1 = 0.14

B/H = (417)/(70) = 5.95

$$R_2 = \frac{2\sigma d}{sB} + 0.1 = \frac{2(10000)(20)}{(4458)(417)} + 0.1$$

= .215 + 0.1 = .315

$\epsilon_{hm} = R_1 \cdot R_2 \cdot \delta/d$ = (0.14)(0.315)(0.03) = 0.00164 ft./ft.

$g_s = \epsilon_{hm} \cdot 12 \cdot L$ = ( )(12)( ) = _____ in.

$$g_r = \frac{2.5\ D_o\ \delta}{B} = 2.5\ \frac{(\quad)(\quad)}{(\quad)} = \text{_____ in.}$$

J = g_s + g_r + F.S. = _____ + _____ + F.S.

= _____ + F.S.

U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, FORT WORTH, TEXAS
0000-000-0000 0000, 000. 1970

APPENDIX H

REFERENCES

APPENDIX H

REFERENCES

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FILM